

UNIVERSITY OF LONDON  
FRANCIS GALTON LABORATORY FOR NATIONAL EUGENICS

EUGENICS LABORATORY MEMOIRS. XIV

A PRELIMINARY STUDY OF EXTREME  
ALCOHOLISM IN ADULTS

BY

AMY BARRINGTON AND KARL PEARSON, F.R.S.

WITH THE ASSISTANCE OF

DAVID HERON, D.Sc.

CAMBRIDGE UNIVERSITY PRESS

C. F. CLAY, MANAGER

LONDON: FETTER LANE, E.C.    EDINBURGH: 100, PRINCES STREET

H. E. LEWIS, 136, GOWER STREET, LONDON, W.C.  
WILLIAM WESLEY AND SON, 28, ESSEX STREET,  
LONDON, W.C.

CHICAGO: UNIVERSITY OF CHICAGO PRESS

BOMBAY, CALCUTTA AND MADRAS:  
MACMILLAN AND CO., LIMITED  
TORONTO: J. M. DENT AND SONS, LIMITED  
TOKYO: THE MARUZEN-KABUSHIKI-KAISHA

1910

*Price Four Shillings*



UCL0083334

University of London, University College, W.C.

**The Francis Galton Laboratory  
for National Eugenics.**

*Presented by*.....

*Purchased*.....19

LB

3(2)

GALTON LAB FILMS 116

WITHDRAWN FROM UC LIBRARY STOCK





# A PRELIMINARY STUDY OF EXTREME ALCOHOLISM IN ADULTS

BY

AMY BARRINGTON AND KARL PEARSON, F.R.S.

WITH THE ASSISTANCE OF

DAVID HERON, D.Sc.

CAMBRIDGE UNIVERSITY PRESS

C. F. CLAY, MANAGER

LONDON: FETTER LANE, E.C.    EDINBURGH: 100, PRINCES STREET

H. K. LEWIS, 136, GOWER STREET, LONDON, W.C.

WILLIAM WESLEY AND SON, 28, ESSEX STREET,  
LONDON, W.C.

CHICAGO: UNIVERSITY OF CHICAGO PRESS

BOMBAY, CALCUTTA AND MADRAS:

MACMILLAN AND CO., LIMITED

TORONTO: J. M. DENT AND SONS, LIMITED

TOKYO: THE MARUZEN-KABUSHIKI-KAISHA

1910

PAPERS DEALING WITH ALCOHOLISM BY MEMBERS OF THE GALTON  
LABORATORY FOR NATIONAL EUGENICS

Published by the Cambridge University Press, Fetter Lane, E.C.

*Eugenics Laboratory Memoirs X.* A First Study of the Influence of Parental Alcoholism on the Physique and Ability of the Offspring. *Second Edition.* Price 4s.

*Questions of the Day and the Fray.* No. I. Supplement to the Memoir entitled: The Influence of Parental Alcoholism on the Physique and Ability of the Offspring. A Reply to the Cambridge Economists. Price 1s.

*Eugenics Laboratory Memoirs XII.* A Preliminary Study of Extreme Alcoholism in Adults. Price 4s.

*Eugenics Laboratory Memoirs XIII.* A Second Study of the Influence of Parental Alcoholism on the Physique and Ability of the Offspring. A Reply to Medical Critics and an Examination of their Rebutting Evidence. Price 4s.



## CONTENTS

	PAGE
(1). INTRODUCTORY. MATERIAL . . . . .	5
(2). THE FACTORS OF ALCOHOLISM . . . . .	6
(3). THE RELATIVE VALUE OF THE RECORD OF CONVICTIONS . . . . .	6
(4). CATEGORIES FOR CHARACTERISTICS OF INEBRIATES . . . . .	8
(5). DIFFERENTIATION OF ALCOHOLISTS FROM THE GENERAL POPULATION WITH REGARD TO MENTAL CAPACITY . . . . .	13
(6). PRELIMINARY CONSIDERATION OF PROSTITUTION AND ALCOHOLISM. MENTAL CAPACITY OF PROSTITUTES WHO ARE ALCOHOLISTS . . . . .	18
(7). RELATIONS OF ALCOHOLISM TO EDUCATION, RELIGION, AND AGE . . . . .	20
(8). RELATIONS OF MENTAL DEFECT, EDUCATION, AND AGE TO ALCOHOLISM . . . . .	25
(9). RELATIONS OF CIVIL STATUS AND PROSTITUTION TO ALCOHOLISM . . . . .	28
(10). RELATIONS OF MENTALITY AND PHYSIQUE TO ALCOHOLISM . . . . .	33
(11). ON A SECOND METHOD OF MEASURING INTENSITY OF ALCOHOLISM . . . . .	34
(12). RELATIONS OF CONDUCT TO MENTAL DEFECT AND ALCOHOLISM . . . . .	38
(13). CONCLUSIONS . . . . .	39
APPENDIX OF TABULATED DATA . . . . .	46



# THE TREASURY OF HUMAN INHERITANCE

ISSUED BY

THE FRANCIS GALTON LABORATORY FOR NATIONAL EUGENICS

The Francis Galton Laboratory is issuing in parts at short intervals a collection of published and unpublished family pedigrees, illustrating the inheritance in man of mental and physical characters, of disease and of abnormality.

Students of heredity find great difficulty in obtaining easy access to material bearing on human inheritance. The published material is voluminous, scattered over a wide and often very inaccessible journalistic area. The already collected although unpublished material is probably as copious, but no central organ for its rapid publication in a standardized form exists at present. The Eugenics Laboratory alone possesses several hundred pedigrees of family characteristics and diseases which it is desirable to make readily accessible. Many medical men possess similar material, and there is a growing desire among genealogists to pay more attention to family characters and supplement the merely nominal pedigrees current in the past.

For a publication of this kind to be successful at the present time, it should be entirely free from controversial matter. The *Treasury of Human Inheritance* will therefore contain no reference to theoretical opinions. It will give in a standardized form the pedigree of each stock. This will be accompanied by a few pages of text describing the individual members of the stock, giving references to authorities, and, if the material has been published, to the *locus* of original publication. When necessary the characteristic will be illustrated by photography or radiography. In this way it is hoped in the course of a few years to place a large mass of material in the hands of the student of human heredity. It will not cut him off from, but directly guide him to original and fuller sources of information. Further, the *Treasury* will provide students of eugenics and of sociology, medical men, and others, with an organ where their investigations will find ready publication, and where as time goes on a higher and more complete standard of family history than has hitherto been usual can be maintained. It is proposed to issue the *Treasury of Human Inheritance* in quarto parts at about quarterly intervals. Each part will contain about 6 to 10 plates of pedigrees and of such other illustrations as may be needful.

The following parts have already been issued:—

Parts I and II (double part) contains pedigrees of Diabetes insipidus, Split-Foot, Polydactylism, Brachydactylism, Tuberculosis, Deaf-Mutism, and Legal Ability. Price 14s.

Part III contains pedigrees of Angioneurotic Oedema, Hermaphroditism, Deaf-Mutism, Insanity, and Commercial Ability. Price 6s.

Part IV contains pedigrees of Hare-Lip, Cleft Palate, Deaf-Mutism, and Congenital Cataract. Price 10s.

Parts V and VI contains pedigrees of Haemophilia. Price 15s.

CAMBRIDGE UNIVERSITY PRESS

C. F. CLAY, MANAGER

LONDON: FETTER LANE, E.C. EDINBURGH: 100, PRINCES STREET

H. K. LEWIS, 136, GOWER STREET, LONDON, W.C.  
WILLIAM WESLEY AND SON, 28, ESSEX STREET,  
LONDON, W.C.

CHICAGO: UNIVERSITY OF CHICAGO PRESS

BOMBAY, CALCUTTA AND MADRAS:  
MACMILLAN AND CO., LIMITED  
TORONTO: J. M. DENT AND SONS, LIMITED  
TOKYO: THE MARUZEN-KABUSHIKI-KAISHA



## Cambridge University Press

The following publications of the Department of Applied Statistics are now issued by the Cambridge University Press, viz. :—

### *Galton Eugenics Laboratory Publications*

- I. Lecture Series.
- II. Memoir Series.
- III. Questions of the Day and the Fray.

### *Drapers' Company Research Memoirs*

- I. Technical Series.  
Biometric Laboratory Series.
- II. Biometric Series.
- III. Studies in National Deterioration.

Copies may be obtained from :—

The Cambridge University Press, C. F. CLAY, Manager;  
London: Fetter Lane, E.C.; Edinburgh: 100, Princes Street,  
or from The University of Chicago Press, Chicago, Ill., U.S.A.

Lists of the various series post free on application.





## A PRELIMINARY STUDY OF EXTREME ALCOHOLISM IN ADULTS

(1) *Introductory.* A first paper on the subject of Alcoholism issued by the Galton Eugenics Laboratory deals with the influence of parental alcoholism on the health and mentality of the offspring as children. An inquiry concerning the various factors involved in the problem of extreme alcoholism in the adult is in some respects much harder, because available data are fewer and in many respects less definite. A great deal of useful information must lie buried in the records of the various inebriate reformatories, but as a rule the official reports only publish massed data, which, as in so many other cases, are of practically little service from the standpoint of modern statistical methods. Further, one cannot be certain, even if these records were available for examination, that the categories used for mental condition, physical state, education, occupation, conduct, &c., would be equivalents. Still, something of value would be certain to follow were there even approximation to uniformity in the categories used, and the official reports gave the actual record for each inmate individually. It is the want of *individual* records, which from the statistical aspect is the most serious defect of the official or annual reports of many institutions, in particular of asylums for the insane and reformatories for inebriates. By a suitable choice of symbols the account of 50 to 60 patients can be placed on a single page, and 4 to 5, or in the case of large institutions 10 to 12, pages of printed matter would provide all the requisite data and furnish a permanent record from which all manner of investigations might start.

That individual records can be quite easily printed is shown by the Annual Reports of the Langho, or Lancashire Reformatory. Such individual records are there given, which, although not quite complete, are nearly so. Owing to the great courtesy of Dr. F. A. Gill, the Director of the Lancashire Inebriates Reformatory, who has supplemented the data in his published reports, we have been able to obtain particulars as to the mental condition, physical state, and conduct of 207 female inebriates, and as to the age, number of convictions, religion, and education of 333 female inebriates. Most of the data as to the latter will be found fully recorded in the six Annual Reports of the Langho Reformatory from 1905 to 1910. Five of the latter group of 333 women had to be omitted from our tables because entries with regard to them failed under one or more categories. Such is the somewhat slender material discussed in the present paper, the object of which is in the first place to induce those in whose power it lies to tabulate and publish *individual*

records. It will, we think, be seen from this discussion that many interesting problems, here only suggested, can be definitely determined when this method of record has been more generally carried out.

(2) *The Factors of Alcoholism.* The chief problem concerning the alcoholicist\* is undoubtedly the discovery and due weighting of the factors which have led to his or her observed condition. If we find that the alcoholicist is mentally or physically on a lower plane than the normal human being, are we to attribute one or both these states to the alcoholism, or is the alcoholism to a greater or less degree the result of mental or physical deficiency? To what extent is it a misfortune of environment which has brought about alcoholism, and has this in its turn produced mental or physical degeneracy? Or, are one or both of these only antecedents to the alcoholism, which has really resulted from them? Should the latter in whole or part be the case, we should anticipate that alcoholism would so far prove to be hereditary in that it would be associated with a type of constitution itself hereditary in character. The characteristics of such a constitution may then manifest themselves not only in alcoholism, but possibly in neuroses, insanity, mental defect, and criminality. Alcoholism might thus prove to be only one of several *aliases*, whose hereditary diathesis can only be expressed by some general term such as "want of mental balance". It will probably need a long and complicated inquiry to deal adequately with the many difficult points surrounding these problems. But it should be possible to throw some light on them by sifting the records of the inebriate reformatories. Do the physique and mentality of the alcoholic grow definitely worse as they age? Does alcoholism appear to be a result of defective education, of race, of religious belief or temperament? At least some information on these points ought to flow from the reformatory records.

(3) *The Relative Value of the Record of Convictions.* In order to justify legal detention in an inebriate reformatory at least four convictions must be proved against the individual.† It is not needful to state the whole number of previous convictions, and the police are not compelled to give a complete record of the police-court career of the individual. In many cases, of course, a woman keeps on reappearing at the same court or in the same district, and thus her previous history and number of convictions are well known to the police. A good number of the cases, however, belong to a floating, often a prostitute population, with many homes and many *aliases*, and relatively little attention is said to be paid to the true total of previous convictions, provided the legally requisite number, or probably some number in excess of it, has been demonstrated. On this account the number of convictions cannot be taken as a wholly satisfactory or absolute measure of the length or intensity of the alcoholism of the individual. We can conceive no more useful social work than the

\* We are not aware whether this word has been previously used, but it is most inconvenient to have no separate noun and adjective and to use alcoholic for both.

† One or two exceptional cases, probably committed by consent, had less than the four convictions.



careful record of the lives of a hundred or more of these inebriates, with an exact enumeration of their police-court appearances. Failing this, are we to assume that the recorded number of convictions is perfectly idle as a measure of past alcoholic history, or on the other hand may it with due caution be used as the best measure at present available? While quite prepared to be told that in individual cases a woman with 12 convictions recorded against her, has been shown on fuller inquiry to have been convicted 40 times, we yet believe that such individual cases, while weakening, do not invalidate conclusions based on the assumption that the recorded number of convictions is a rough measure of the length and the intensity of alcoholic life. We believe in fact that—at any rate in the case of the Lancashire data—there exists a fairly high correlation between actual and recorded number of convictions. Our chief reason for this lies in the principle that if the number of convictions were given practically at random, provided it exceeded four, that number would be allotted in precisely the same manner as if we drew a number exceeding four out of a bag and handed one to each inebriate as her record. Of course it would come to the same result if we simply sorted out at random the numbers of convictions among the convicted, and this random sorting has actually been carried out with the results indicated in the table below:—

TABLE I. MEAN NUMBER OF CONVICTIONS (207 CASES).

	Actual.	Random Sortings.	
		1st Trial.	2nd Trial.
All Population . . . . .	28.34	28.34	28.34
Mentally, Normal . . . . .	22.08	26.04	29.61
„ Defective . . . . .	33.35	30.17	26.75
Physically, Fit . . . . .	26.64	27.82	28.03
„ Unfit . . . . .	34.44	30.22	29.44
Conduct, Well-behaved . . . . .	25.78	28.31	26.91
„ All others . . . . .	34.75	28.42	31.83

It will be seen that the actual number of convictions of those mentally defective or physically unfit, or not well behaved, is sensibly larger than those of the mentally normal or physically fit or well behaved. In the case of the random sortings this difference is not always preserved. The random variations between the means of each category of the three classes are also far less than those between the means of the actual characters. It seems accordingly reasonable to assert that while the correlations between number of convictions, and the moral, mental, and physical conditions might well be higher, if we had the exact instead of the recorded number of convictions, yet the recorded numbers are *some* measure of the length and intensity of the alcoholism. This may be further illustrated by the correlation of number of convictions with age of the inebriate. For the actual distribution  $r = .29 \pm .04$ .

Two random distributions were made of the convictions and ages, one gave  $r = +.085 \pm .047$ , the other gave  $r = -.084 \pm .047$ , neither significant having regard to their probable errors.\* It may be argued that age would be far more highly correlated than the above value ( $.29$ ) indicates with the actual number of convictions. Probably the true correlation is higher, but at the same time it must be remembered that alcoholism develops at different ages with different individuals; the alcoholism of the housewife may occur at a much later stage than that of the prostitute, who may reach the same total of convictions at a much earlier stage than the woman who has more means of privacy and more people to look after her in her bouts. On the whole the value found, while undoubtedly a minimum value, may not be so excessively in error, as a mere general impression of the rough character of the recorded number of convictions might lead one to suppose. We think accordingly that the recorded number of convictions is of some value, and that it is worth while to see what suggestions flow from taking it as some rough measure of the intensity of the alcoholism.

(4) *Categories used for Characteristics of Inebriates.* The classifications at Langho having been made by one medical superintendent are therefore subject solely to one personal equation, and this is an advantage, to some extent compensating for the smallness of the totals available from one reformatory.

Dr. Gill has the following categories of mental condition: *Average, Slightly Defective, Defective, Very Defective*, and *Insane*. The numbers (207) are so few that we have for purposes of reduction classed these as *Normal* (= *Average*) and *Defective* (= all the rest).

In Dr. Branthwaite's *Report* for 1908 we have the following definitions and details for 3,032 inebriates. Unfortunately for our present purpose males and females are combined:—

(i) Average mental capacity on admission or after six months' detention, 1,105 = 36.45 %. (ii) Defective—Persons who are eccentric, silly, dull, senile, or subject to periodical paroxysms of ungovernable temper, 1,487 = 49.04 %. (iii) Very defective—Persons who after admission to reformatories were found to be more or less congenitally imbecile, degenerate, or epileptic, 377 = 12.43 %. (iv) Insane—Persons who since admission to reformatories have been certified and sent to asylums, 63 = 2.08 %.<sup>†</sup> Hence the total percentage in whom want of mental balance was found amounted to 64 %. This is strikingly close to the Langho total (see our p. 25) of 63 %, although in the latter case we have females only. This correspondence necessarily gives us greater faith in the relatively smaller numbers we have been able to use. We are credibly informed that in one large female prison in this country 80 % of the prisoners are mentally defective, and among male convicts Goring reports 45 % as mentally defective. Now we have had the great advantage

\* The fact that they should have come so nearly equal but of opposite signs is, of course, only casual.

† This percentage cannot be *very* largely in excess of insanity in the general population.



of consulting Dr. James Kerr with regard to the relation of this scheme to the classification of mentally defective children. He considers that the value he gave to the Committee making inquiries in 1906 of 2 % has been more or less justified. After that Committee the estimates gave 1 %, but the estimated values have been gradually rising since, and will apparently reach 2 %.\* The definition of mental defect is, however, one made purely for scholastic purposes, and means children requiring education in other ways than the ordinary elementary school. The shades of defect are so gradual that the estimate of numbers must always depend on personal equation until some comparatively accurate mode of estimation has been established. At present all we can say is that the estimate of mental defect in school children runs from something under 1 % to something under 2 %, according to locality and observer. If the classification used for inebriates be compared with that for school children, there are one or two points which present difficulty. In Class (iii) the term "degenerate" is very hard to interpret, and probably it is impossible to distinguish such cases from many in Class (ii).† Again, there is a real need for a class between (i) and (ii), at any rate for scholastic purposes, namely (i)<sup>bis</sup>, which Dr. Kerr would define as follows: "Backward, generally incapable of average attainment in more abstract matters, and much behind in school work." The differentiation of (i)<sup>bis</sup> and (ii) is where most personal equation would enter. Many of (i)<sup>bis</sup> can only be distinguished from (ii) after prolonged observation, and (ii) undoubtedly contains a proportion of neglected children. But on broad lines (ii), (iii), and (iv) correspond to the mentally defect of the scholastic classification, and amount to something under 2 %. Class (i)<sup>bis</sup> probably contains another 5 % to 10 %, but has hardly yet been properly estimated. The above allocation indicates the point where we had already drawn our division before consulting Dr. Kerr, and it is of great value to us to have his opinion that the mentally defective of the schools embrace substantially Classes (ii), (iii), and (iv) of Dr. Branthwaite's classification.

In actually dealing with the school material, we have to remember that the mentally defective children, except in very marked and obvious cases, are not drafted at once into the special schools—probably not till the age of 9 or 10, when they have left the infant schools. Working on statistics provided by Dr. Kerr, which include mentally defective children in the special schools and children certified as such in the ordinary schools, we find the following percentages for London:

Boys: 1.59

Girls: 1.09

Through the courtesy of Dr. E. W. Hope, Medical Officer of Health for Liverpool, we find from similar data:

Boys: .827

Girls: .618

\* Pearson, *Biometrika*, vol. v, p. 111, from data from his school investigations gives 1.88 % of very dull and imbecile children.

† The subclass here with paroxysms of ungovernable temper probably have some features of an epileptic nature.

This Liverpool return is of importance to us as being nearer to the population from which Langho is chiefly recruited. In both London and Liverpool cases there would be a considerable reduction of these percentages, if the "Infants" were included in the totals, but we do not think this justifiable, and our results without this inclusion will indicate a *minimum*, not a maximum limit to the correlations between mental defect and alcoholism, which we are seeking. Clearly the school returns would indicate that 1 % of mental defect in females\* is to be expected in the community at large, as against the 64 % found among inebriates.

For physical condition Dr. Gill divides simply into *Fit for hard work* and *Unfit for hard work*; for brevity we speak of these as *Fit* and *Unfit*. In the case of conduct in the reformatory he divides into *Well-behaved*, *Manageable*, *Troublesome*, and *Very Troublesome*. The last two categories contain only 4 % and 5 % of the inmates;† we have accordingly, for statistical purposes, had to throw them in with the *Manageable*. This is unfortunate, but such small percentages cannot be dealt with effectively until far larger numbers are available; no wise statistician will trust to means based on 8 or 10 individuals. The *Manageable* certainly mean those who need management, or they would be under the well-behaved. They are probably troublesome or difficult by nature, but manageable owing to their experience of the ill effects of bad conduct on their own comfort.‡ Thus of the manageable 60 % are defective mentally, while of the well-behaved only 27 %; again 90 % of the former and only 75 % of the latter are physically fit. In other words the "manageable" class are physically fitter, but mentally more defective than the well-behaved.

Two classifications of education may be made which are of extreme service. The one records the nature or class of education which has been provided, the other marks the profit which the individual has received from it. We shall speak of these as *formal* education, and *effective* education. It should be noted that for the class we are dealing with the category of both types of education is practically settled when the alcoholic was a child, and before the onset of alcoholism. Any relationship between these education categories and other characters of the alcoholic is a relation which to a large extent must antedate the alcoholism.

The formal education categories are *Good*, *Fair*, *Elementary*, *Poor*, *Imperfect*, *Very Little*, *Defective*, *Bad*, and *Nil*. We have had to content ourselves, considering the total numbers at our disposal, with placing the first three categories together as *Better Education*, and the remainder as *Worse Education*.§ The effective education

\* The greater percentage of mental defect in boys has been already recognized, but so far no explanation is forthcoming.

† Dr. Branthwaite (*Report*, 1908) gives details as to conduct of 3,032 male and female inebriates. The four classes give respectively: 1,746, 763, 285, 238, or 57.59 %, 25.16 %, 9.4 %, 7.85 %.

‡ Beyond the risk that extreme troublesomeness may involve the culprits being treated as insane and sent to an asylum, certain cases are transferred every year to the State inebriate reformatories, where the discipline is probably sterner.

§ Even this division is not satisfactory. At Langho it gives 270 individuals with *better* and only



categories are: (1) Can neither read nor write, (2) Read and write imperfectly, (3) Read and write well, (4) Superior education. It will be seen that these categories turn largely on the profit obtained by the formal education. The classification by means of effective education is far more satisfactory from the statistical standpoint than that by means of formal education. If we put (1) and (2) together as worse education, and (3) and (4) as better education, we find 73.4 % with worse and 26.6 % with better education, as against 82.3 % and 17.7 % on the formal education categories.\* In order to test the nature of the association between the two stages of education we have correlated them together: see Table X. The co-efficient of mean square contingency = .482; we consider this is a better result than that given by a fourfold table (Table X<sup>bis</sup>), both classifications being into *Better* and *Worse*, i.e.  $r = .356 \pm .041$ . Either show that the relation between the two classifications is not very high; that it is as high as it is is probably due to the fact that the formal education classification used is really of a rather mixed kind, and some weight has undoubtedly been given in it to effective education. We may throw still further light on the relationship by examining the correlation of mental capacity and education classified in the two ways. We find: see Tables G, G<sup>bis</sup> and G', G'<sup>bis</sup>:

Correlation of Mental Capacity and Formal Education:  $.341 \pm .041$ ,

                  "                  "                  " and Effective Education:  $.644 \pm .027$ .

The latter is almost double the former. It is difficult to understand how the degree of mental defectiveness should be associated with either educational classifications, if that defectiveness were the product of alcoholism and not an antecedent to it, for, as we have remarked, education in the bulk of these women is almost entirely determined by the conditions of childhood. The partial correlations tend to confirm the view that the mental defect largely antedates the alcoholism. We have:

Mental Capacity and Formal Education for a constant

Effective Education . . . . .  $.046 \pm .047$

Mental Capacity and Effective Education for a constant

Formal Education . . . . .  $.582 \pm .031$

The first is non-significant, the mental deficiency has no relation to the type of education received; the second is hardly less than the total correlation, and indicates that the profit from education is closely associated, for a constant form of education, with the mental capacity as judged in adult life. This is precisely

58 with *worse* education. The bulk of all cases fell into the *elementary* class. Had the *Better Education* been limited to *Good* and *Fair* it would have contained only 25 individuals. We need to split up the big *Elementary* class; it possibly might be done by stating the standard reached.

\* Dr. Branthwaite (*Report*, 1908) gives for the distribution of 3,032 *male* and female inebriates in the four classes: (1) 421 = 13.99 %, (2) 1,465 = 48.32 %, (3) 1,006 = 33.18 %, (4) 140 = 4.62 %. These are not so close to the Langho results—i.e. (1) 20.29 %, (2) 53.14 %, (3) 22.22 %, (4) 4.35 %—as in some other cases. This is probably due to the large Irish element at Langho.

what we should anticipate, if the adult mentality were closely related to the mentality of childhood. It is less easy to account for this association of effective education of childhood and the mentality of adult life, if the latter were in any marked degree a product of alcoholism produced by environmental conditions. We shall return to this point later. We have referred somewhat out of place to it here as justifying us in retaining the two educational classifications. The formal classification is admittedly unsatisfactory, but if extended it might distinctly be of service as a measure of environment in childhood, and enable us more definitely to analyse the current conception that alcoholism is due to defective education. Those who use the phrase rarely distinguish between formal and effective education, and still more rarely between causation and association. We have three characteristics which undoubtedly are associated in a high degree: defective education, alcoholism, and defective mentality. It has been too often asserted without any scientific investigation (especially by the earlier advocates of State compulsory education) that if education were universal and of a high grade, there would be less drunkenness, and as a result less insanity and imbecility in the population. This may or may not be correct; it is quite certain that it receives no proof whatever from the statistical data usually provided in favour of it.

In the matter of religion we have only found it possible to classify the Langho inebriates into Roman Catholics and Protestants; the few data as to the division of the latter are not enough to be of service. The question we had in view in dealing with religion in this matter was really to approach indirectly the problem of race. It seems probable that the bulk of the Roman Catholics at Langho are Irish. The appearance of 166 Catholics and 162 Protestants in a Lancashire Reformatory is itself somewhat noteworthy.\* If we examine the localities from which the convicted were sent, we find that in the case of Liverpool 50 % of the women were Roman Catholic, 50 % were Protestant; in the case of Manchester 33 % were Roman Catholic, 67 % Protestant. This emphasizes the view that we are dealing under Roman Catholics largely with Irish immigrants. As a race the Irish prefer whisky to beer, and new or bad whisky, which is all that is obtainable by the very poor, may be more likely than other forms of alcohol to bring them directly into conflict with the police. It is, perhaps, also unnecessary to add that the Irish immigrants into the Lancashire towns are far from being the best section of the Irish race.

Another important matter which arises in the course of investigations into the social status of these female inebriates is the question of their occupation. Does the absence of definite occupation drive women to alcoholism? This question is one which cannot be answered at all on the material which finds its way into Langho. Absence of occupation must mean independent means, and only one woman at Langho is recorded as having independent means. Every woman, whether single, married,

\* There is no special entry for race in the records. Of those at present in the Reformatory, 41, Dr. Gill tells us, are Irish, and this is probably 50 % of the inmates; the bulk of these will be Catholics.



or widowed, against whom a blank or "nil" was recorded in the occupation column was actually a prostitute, and we found that correlations involving prostitute and non-prostitute were identical with those of occupied and non-occupied, with the exception of the single case just referred to. To say that a woman has no recorded occupation is accordingly merely another manner of stating that the inebriate is by profession a prostitute. We can from our data judge something of the relations of prostitution to alcoholism, but not of the want of occupation to alcoholism. Such is the nature of our material and of its classification; we now turn to the conclusions which may be drawn from it.

(5) *To what extent are Alcoholists differentiated by Mental Capacity from the General Population?* We have already seen that 64 % of convicted male and female inebriates in general and 63 % of female inebriates at Langho are mentally defective in a higher or lower degree. Now we are all fully certain that over 64 % of defectives do not exist in the general population, but it is not so easy to determine what is the proportion of mental defect. We accordingly, with a view of throwing some light on this matter, applied to Dr. James Kerr for data as to the amount of mental defectiveness in the London Schools, and to Dr. E. W. Hope for the similar data as to Liverpool, as closer to the district from which Langho draws its material. They most kindly provided us with the data from which the estimates given on p. 9 were drawn. We shall take these estimates as alternative limits to the extent of mental defect in the population at large. It is perfectly true that these estimates are for the *child* population, but they will give us at least a maximum limit to mental defect in the adult population. This follows because (i) there is accumulating evidence to show that mental defect is hereditary, (ii) the death-rate among these children is undoubtedly higher than among normal children, (iii) the slighter cases of mental defect among children, owing to the influence of training, may not be reckoned as cases of mental defect in adult life. We do not think, therefore, we shall err widely by assuming the percentages in childhood to apply to adult life, even if a certain amount of mental defect is first apparent after adolescence is reached.

Now let us make a table of the following kind :

Mentality.	Rest of Population.	Convicted Inebriates.	Totals.
Normal. . . .	$x$	92	$92 + x$
Defective . . .	$y$	115	$115 + y$
Totals . .	$x + y$	207	$207 + x + y$

In this table  $x$  and  $y$  are at present unknown ; we have given the inebriates the proportions they bear, 92 to 115, in the smaller sample of the Langho women. There is a fundamental point to be observed about this table ; it does not divide the population into the alcoholic and non-alcoholic. The division is made a long distance into the alcoholic section—namely, the tail of extreme chronic alcoholists, women

who have been convicted on an average at least \* 28 times, is cut off. Furthermore, they are not necessarily the worst cases, but those who have the least control over their action, and by offences against public order are brought into conflict with the police. There can be little doubt that these women are to a considerable extent selected by reason of their mental defect. As in the case of criminals, the abler and less mentally defective probably do not so frequently fall into the hands of the police. Putting this fact on one side for the present purpose and supposing our convicted inebriates to be, as they closely must be, the worst cases of alcoholism, let us endeavour to measure the correlation of alcoholism and mental defect on the assumption that mental capacity and the tendency to alcohol are continuously varying quantities. It will be clear that  $(115 + y) \div (207 + x + y)$  will give the ratio of mentally defective women to all women of the given ages. Assuming that we may take the proportions indicated by the school returns this will be .010,900,5 for the London and .006,181,65 for the Liverpool estimates. In the next place  $207/(207 + x + y)$  is the ratio of convicted alcoholists ( $A$ ) to the general population ( $P$ ). In a society like our own this ratio ( $R$ ) will, like most statistical ratios, remain fairly stable for some years, and accordingly the ratio of the variation in  $A$  to the variation in  $P$ , i. e.  $\delta A/\delta P$ , will also be closely equal to  $R$ . Now we can find this ratio. It is the ratio of the increase in the numbers of convicted alcoholists, less the death-rate among the total convicted population in or out of reformatories, to the increase in the population out of which the convicted inebriate women are drawn. According to the Langho returns, the youngest inebriate woman is 16 and the oldest 69. It would seem, therefore, that the convicted inebriates are not drawn from the oldest section of the population. We have accordingly taken  $\delta P$ , the annual change in  $P$  to be the number of women aged 15 less the number of women aged 69 less the number of deaths of women between ages 16 and 69. The population of females was taken from the 1901 Census † and brought up to the basis of the estimated population for 1908. The value of the deaths was taken from the Registrar-General's *Annual Report* for 1908. The number of women aged 15 in 1907 and 69 in 1907 would respectively have entered and left the population  $P$  in 1908. Our estimates which must necessarily be and need only be approximate were:

Number of women aged 69 in 1907 = 65,260.

Number of women aged 15 in 1907 = 351,594.

Number of deaths 16 to 69                      = 107,353.

Hence  $\delta P = 351,594 - 107,353 - 65,260 = 178,981$ .

Our estimated value of number of women between 16 and 69 for the year 1908 was 11,648,969.

The next point is to find  $\delta A$ . This consists of two parts  $\delta A_1$  = number of new convictions and  $\delta A_2$  = number of deaths among the already convicted alcoholists in

\* "At least" because the recorded number of convictions is asserted to fall below the actual number.

† England and Wales.



and out of prison. We have taken for  $\delta A_1$  the average convictions as given by Dr. Branthwaite's Report for 1908, for 1904, 1905, 1906, and 1907 \* reduced to three-quarters of their value. The reduction to three-quarters is based upon the Langho returns which indicate that 25 % of the convictions are reconvictions. This is very probably below the true value, but it is difficult to get accurate data with regard to this point. Thus we have :

$$\delta A_1 = \frac{3}{4} \times \left\{ \frac{1}{4}(380 + 352 + 294 + 428) + 3 \right\} \dagger = 274.875.$$

Let  $\lambda_1 A$  be the number of alcoholists who die in and out of prison, and let  $\lambda_2 P$  be the number of women who die between 16 and 69. Then  $A = RP$  and accordingly  $\delta A_2 = \frac{\lambda_1}{\lambda_2} \times R \times \lambda_2 P = K \times R \times 107,353$ , where  $K$  is a number representing the ratio of the death-rates. Now from the 1901 Census the average age of women from 16 to 69 is 36.05 and the average age of 328 female alcoholists at Langho between 16 and 69 is 36.39. There cannot therefore be much difference between the age distribution as judged by this standard ; it is probable, however, that there are fewer very young and very old alcoholists, and thus the mean ages of alcoholists and general population are brought very closely together. To allow for this we have supposed (i) that the death-rate of these chronic alcoholists is only equal to that of the general population of women of the same mean age, (ii) that it is double that value. Neither of these hypotheses may be correct, but at least they will give a measure of how the correlation of alcoholism and mental defect is modified when we increase the relative death-rate of the alcoholists. We shall accordingly put  $K = 1$  and  $K = 2$  as standard cases. We have for the stability of the population

$$\begin{aligned} \frac{\delta A_1 - KR(107,353)}{\delta P} &= R \\ \therefore R &= \delta A_1 / (\delta P + K \times 107,353) \\ &= 274.875 / (178,981 + K \times 107,353) \\ &= .000,959,980, \quad \text{if } K = 1, \\ &= .000,698,207, \quad \text{if } K = 2. \end{aligned}$$

Now  $P = 11,648,969$  in 1908,

$$\begin{aligned} \text{Hence } A = RP &= 11,183, \quad \text{if } K = 1, \\ &= 8,133, \quad \text{if } K = 2. \end{aligned}$$

In other words, had the present system been in existence long enough we should have had somewhere between 8,000 and 11,000 convicted female alcoholists in or out of reformatories. Allowing for the death-rate roughly, it would have taken at the present rate of convictions 40 to 50 years to have passed this number through the reformatories ; of course a much longer period than the system has been at work. About  $\frac{1}{41}$  to  $\frac{1}{30}$ , according to which value of the death-rate we use, is added by conviction to the total convicted alcoholist population each year.

\* 1908 was not used, because, for reasons stated in the *Report*, it was 50 % below usual value.

† Here the 3 is introduced to account for transfers to State-prisons.

We are now in a position to write down our equations and form our tables; we have:

$$\frac{207}{207+x+y} = \begin{matrix} .000,959,980, & \text{or} = .000,698,207, \\ (K = 1) & (K = 2) \end{matrix}$$

$$\frac{115+y}{207+x+y} = \begin{matrix} .010,900,5, & \text{or} & = .006,181,65. \\ \text{(London percentage)} & \text{(Liverpool percentage).} \end{matrix}$$

These alternative equations may be coupled in four ways giving the following values of  $x$  and  $y$ :

Death Rates.	$K = 1.$		$K = 2.$	
Mental Defectives.	$x =$	$y =$	$x =$	$y =$
London Percentage . . .	213,187	2,235	293,150	3,117
Liverpool Percentage . .	214,204	1,218	294,549	1,718

These lead us to the following fourfold tables:

- (i) LONDON PERCENTAGE OF MENTAL DEFECTIVES. DEATH-RATE OF CONVICTED ALCOHOLISTS  
EQUAL TO THAT OF THE GENERAL POPULATION.

	Not C. A.	C. A.	Totals.
Normal . . . . .	213,187	92	213,279
Mentally Defective . .	2,235	115	2,350
Totals . . . . .	215,422	207	215,629

- (ii) LONDON PERCENTAGE OF MENTAL DEFECTIVES. DEATH-RATE OF CONVICTED ALCOHOLISTS  
TWICE THAT OF THE GENERAL POPULATION.

	Not C. A.	C. A.	Totals.
Normal . . . . .	293,150	92	293,242
Mentally Defective . .	3,117	115	3,232
Totals . . . . .	296,267	207	296,474

- (iii) LIVERPOOL PERCENTAGE OF MENTAL DEFECTIVES. DEATH-RATE OF CONVICTED ALCOHOLISTS  
EQUAL TO THAT OF THE GENERAL POPULATION.

	Not C. A.	C. A.	Totals.
Normal . . . . .	214,204	92	214,296
Mentally Defective . .	1,218	115	1,333
Totals . . . . .	215,422	207	215,629



(iv) LIVERPOOL PERCENTAGE OF MENTALLY DEFECTIVES. DEATH-RATE OF CONVICTED ALCOHOLISTS  
TWICE THAT OF THE GENERAL POPULATION.

	Not C. A.	C. A.	Totals.
Normal . . . . .	294,549	92	294,641
Mentally Defective . .	1,718	115	1,833
Totals . . . . .	296,267	207	296,474

These four tables lead to the following four equations :

$$\begin{aligned}
 \text{(i)} \quad 5.61540 &= r + 3.55847r^2 + 6.12720r^3 + 4.44449r^4 - .27876r^5 \\
 &\quad - 1.11864r^6 + .75758r^7 - .30710r^8 ; \\
 \text{(ii)} \quad 5.47103 &= r + 3.66488r^2 + 6.54215r^3 + 4.98062r^4 - .33917r^5 \\
 &\quad - 1.73411r^6 + .52048r^7 - .33719r^8 ; \\
 \text{(iii)} \quad 9.31956 &= r + 3.88064r^2 + 7.56063r^3 + 6.98079r^4 + 1.45753r^5 \\
 &\quad - 1.03394r^6 + 1.19942r^7 + .72012r^8 ; \\
 \text{(iv)} \quad 9.08081 &= r + 3.99677r^2 + 8.07134r^3 + 7.82402r^4 + 1.76820r^5 \\
 &\quad - 1.60585r^6 + .82421r^7 + .78930r^8 ;
 \end{aligned}$$

and there result the following four correlation coefficients :

	Death-rate of Alcoholists.	
	Equal to Normal.	Twice Normal.
London percentage :	$r = .705,$	$r = .688,$
Liverpool percentage :	$r = .773,$	$r = .747.$

Thus notwithstanding considerable changes in the death-rate and the percentage of defectives assumed for the general population, we find a very high relationship, .70 to .80, between alcoholism and mental defect. It is true that as in the case of criminality this association has been often asserted, but the object of the inquiry in this section has been to obtain by approximate but reasonable assumptions a *numerical* measure of its intensity. No fact is fully appreciated until we have such a measure of its significance.

The chief objections that may be raised against our methods are :

(i) We have taken the mental defectiveness of childhood as a measure of the prevalence of mental defect in adult life. Now certainly a higher number of these mentally defective children die than of normal children. The effect of a lesser amount of defectiveness in adult life would, however, *increase* the correlation. The same change would occur, if we lessen the adult defectiveness by supposing some mentally defective children to become normal adults. Even if mental defect were itself the product of alcoholism, we can hardly accept the view that this or other source of mental defect in adults would cause the number of adult mentally defectives to exceed largely the proportion in the child population. The London estimate of mental defect is 1.76 times the Liverpool estimate, but this wide difference has only made

a change of about 8 or 9 % in the correlation, a change almost within the probable error of the result.

(ii) It may be argued that the female convicted inebriates are not selected by the fact of their extreme alcoholism, but by the effect of their stupidity, which throws them into the hands of the police. In the case of women, a large percentage of whom are prostitutes with no protection when in a state of alcoholism, it may, however, be doubted whether any degree of intelligence would preserve them from conflict with the police when drunk. The argument should be borne in mind, as it may to some extent account for the very high correlation. At the same time it should be noted that by using the 207 sample we have reduced the extent of the mentally defective among the inebriates to 55.5 %, a figure considerably below the 63 % of the larger Langho numbers or the 64 % of Dr. Branthwaite's figures. We could thus allow a good deal to the selective action of stupidity without sensibly altering the result.

We are inclined, however, to hold that the convicted female inebriates represent an average mental sample of extreme chronic alcoholists, and to assert that there exists a correlation of something like .70 to .80 between mental defect and alcoholism in the population of this country. Of these two characteristics, which is antecedent and which is consequent? That is the real problem of alcoholism in its extreme forms.

(6) *Preliminary Remarks on Prostitution and Alcoholism.* Working on the same lines as the previous section we can obtain an estimate of the number of convicted\* prostitute inebriates in the community (England and Wales). According to the Langho data among the inebriate prostitutes the normal and the mentally defective are in the ratio of 36 to 47. This gives a percentage of 56.6 %, slightly greater than that of the like classes in all convicted inebriates as given in the 207 sample, but less than the 64 % as provided by the larger returns. We shall discuss certain features of the distribution of intelligence in prostitutes later on. Working from this 56.6 % basis, we may, we hold, reasonably assume that the ratio of alcoholic prostitutes ( $\pi_p$ ) to all alcoholists is a fairly stable statistical constant. In other words we have :

$$\delta\pi_p/\delta A = \pi_p/A = 83/207$$

$$\begin{aligned} \text{but } \delta A &= 274.875 - .000,959,980 \times 107,353 (K = 1) \\ &= 274.875 - .000,698,207 \times 2 \times 107,353 (K = 2) \\ &= 171.818 (K = 1) \text{ or } 124.966 (K = 2). \end{aligned}$$

This gives :  $\delta\pi_p = 68.893 (K = 1)$  or  $50.107 (K = 2)$  leading to :  $N = 215,630$ † and 296,474 practically agreeing with the values on p. 16 above. We have  $\pi_p = 4,484$  and 3,261, as the number of convicted alcoholic prostitutes that would exist in the community had the system been long established. We have accordingly

\* This word is of course used in a special sense; the estimate obtained is of those who would have been convicted had the system been for 40 or 50 years in working order.

† We have used 215,629 as in the previous Tables.



the tables given below on the fourfold hypotheses, where we have assumed the death-rate of the prostitute class to be either once or twice the general death-rate.

The following four equations were obtained for the correlation coefficients :

$$\begin{aligned}
 \text{(i)} \quad 5.33964 &= r + 3.85792r^2 + 7.32635r^3 + 6.04618r^4 - .46426r^5 \\
 &\quad - 3.17811r^6 - .24657r^7 - .47007r^8. \\
 \text{(ii)} \quad 5.21721 &= r + 3.95719r^2 + 7.74521r^3 + 6.64113r^4 - .54046r^5 \\
 &\quad - 4.11265r^6 - .90811r^7 - .44316r^8. \\
 \text{(iii)} \quad 8.86042 &= r + 4.20719r^2 + 9.03833r^3 + 9.49651r^4 + 2.42743r^5 \\
 &\quad - 2.93745r^6 - .30938r^7 + 1.10180r^8. \\
 \text{(iv)} \quad 8.65796 &= r + 4.31555r^2 + 9.55561r^3 + 10.43239r^4 + 2.81755r^5 \\
 &\quad - 3.80154r^6 - 1.43804r^7 - 1.05941r^8.
 \end{aligned}$$

These give (i) :  $r = .665$ , (ii) :  $r = .649$ , (iii) :  $r = .715$ , (iv) :  $r = .706$ .

(i) LONDON PERCENTAGE OF MENTALLY DEFECTIVES. DEATH-RATE OF CONVICTED ALCOHOLIC PROSTITUTES EQUAL TO THAT OF THE GENERAL POPULATION.

	Not a C. A. P.	C. A. P.	Totals.
Normal . . . . .	213,243	36	213,279
Mentally Defective . .	2,303	47	2,350
Totals . . . . .	215,546	83	215,629

(ii) LONDON PERCENTAGE OF MENTALLY DEFECTIVES. DEATH-RATE OF CONVICTED ALCOHOLIC PROSTITUTES TWICE THAT OF THE GENERAL POPULATION.

	Not a C. A. P.	C. A. P.	Totals.
Normal . . . . .	293,206	36	293,242
Mentally Defective . .	3,185	47	3,232
Totals . . . . .	296,391	83	296,474

(iii) LIVERPOOL PERCENTAGE OF MENTALLY DEFECTIVES. DEATH-RATE OF CONVICTED ALCOHOLIC PROSTITUTES EQUAL TO THAT OF THE GENERAL POPULATION.

	Not a C. A. P.	C. A. P.	Totals.
Normal . . . . .	214,260	36	214,296
Mentally Defective . .	1,286	47	1,333
Totals . . . . .	215,546	83	215,629

(iv) LIVERPOOL PERCENTAGE OF MENTALLY DEFECTIVES. DEATH-RATE OF CONVICTED ALCOHOLIC PROSTITUTES TWICE THAT OF THE GENERAL POPULATION.

	Not a C. A. P.	C. A. P.	Totals.
Normal . . . . .	294,605	36	294,641
Mentally Defective . .	1,786	47	1,833
Totals . . . . .	296,391	83	296,474

We see that there is again a very high correlation between mental defect and alcoholic prostitution. There is small doubt that it is in these cases that prostitution takes its most baleful form; it is probable that in the lowest grades of prostitution all with scarcely an exception are alcoholic. Our table may therefore approximately represent the general relation between prostitution and mental defect without regard to alcoholism; we have merely drawn a line across the population at extreme forms of prostitution, and we find that prostitution is intimately associated with mental defect. Our data—through no fault of our own—are very slender, and it would be idle on their basis to assert that mental defect is more closely associated with alcoholism than with prostitution.\* But we have evidence enough to show that the three factors, prostitution, alcoholism, and mental defect, are all closely related. Which again of these, we ask, is antecedent, which are the consequents? Do prostitution and mental defect result from a tendency to drink? Or does the life of a prostitute lead to alcoholism and mental defect? Or, lastly, is the mental defect the antecedent to both prostitution and alcoholism? Of course it is quite possible that each of the three factors may in different cases be either primary or secondary; of one thing, however, we are certain; there are very considerable numbers of mentally defective girls in this country who, as they pass towards womanhood and out of any control, undoubtedly become both prostitutes and alcoholic. Until the life-history of such girls is more fully recorded and their numbers better known, it is idle to assert that because mental defect and prostitution are found closely associated with alcoholism they are the results of it. We might with equal want of logic assert that mental defect flows from criminality because of its very close association with it. The mentally defective man—in a large number of cases alcoholic—who is convicted of crimes of violence, rape, or arson, has the same origin, and is governed by largely the same impulses as the mentally defective woman who takes to prostitution and extreme alcoholism. We gain little for social reform when we assert that alcohol is the chief source of prostitution, crime, imbecility, and insanity, as long as we have not demonstrated that congenital mental defect is itself insufficient to produce the great bulk of the alcoholism, prostitution, and crime. It appears to us that ampler statistics carefully collected by organizations already existing might within a reasonable time give a quite definite answer to the problem of whether in the main alcoholism or mental defect, or again prostitution or mental defect, is the antecedent. We know from the school medical examinations that much mental defect antedates crime, alcoholism, and prostitution. Why, when we meet mental defect once more in the adult criminal and prostitute, are we to assume it, without any careful inquiry, as a new product, the result of alcoholism? Association is not necessarily causation.

(7) *Relation of Alcoholism to Education, Religion (? Race), and Age.* In this section we are able to deal with 328 cases for formal education, but only 207 cases for effec-

\* In the 207 sample the prostitutes showed 56.6 % of mental defect, slightly more than the other alcoholists. But the convicted alcoholists in general show 64 %.



tive education.\* We give the results for both under the headings respectively of F. E. and E. E. We first consider tables of means.

TABLE IV. MEANS FOR RELIGION (? RACE). (SEE TABLES E AND C.)

Mean.	Total.	Roman Catholic.	Protestant.
For Age . . . . .	36.39	35.77	37.02
For Number of Convictions . .	28.21	33.27	23.03

TABLE V. MEANS FOR EDUCATION. (SEE TABLES D, B, D', B'.)

Mean.	Total.		Better Educated.		Worse Educated.	
	F. E.	E. E.	F. E.	E. E.	F. E.	E. E.
For Age . . . . .	36.39	35.82	35.44	34.74	40.78	36.21
For Number of Convictions . .	28.21	28.34	25.52	16.18	40.76	32.74

TABLE VI. FREQUENCY FOR EDUCATION. (SEE TABLES F AND F'.)

Religion (? Race).	Better.		Worse.		Totals.		Percentages.			
							Better.		Worse.	
	F. E.	E. E.	F. E.	E. E.	F. E.	E. E.	F. E.	E. E.	F. E.	E. E.
Roman Catholic .	129	73	37	40	166	113	78 %	65 %	22 %	35 %
Protestant . . .	141	79	21	15	162	94	87 %	84 %	13 %	16 %
Totals . . .	270	152	58	55	328	207	—	—	—	—

These results are of great interest. They indicate (Table VI) (i) that the Roman Catholics (? the Irish) have formally a worse education than the Protestants (? the English), and that their general profit by what education they have is markedly less—the percentage in the Roman Catholics who cannot read and write properly is more than double what we find in the Protestants; (ii) that the Roman Catholics (? the Irish) have an intensity of alcoholism—as measured by number of convictions—(Table IV), which is nearly 50 % greater than that of the Protestants, and this result is reached although the Protestant inebriates are slightly older; (iii) there is a difference of more than five years between those better and those worse educated *formally*, which reduces, however, to only 18 months when we consider the *effectiveness* of education. This indicates that probably some of the older inebriates were children before education became compulsory.

\* We actually worked out our results first on a subsample of 152 inebriates in order to test their legitimacy. But no differences, other than those compatible with the larger probable errors of the smaller sample, were sensible in our results. There was always an excess of the same means in the differentiated classes and the correlations were in the same sense. We have not therefore thought it needful to publish the results of this subsample alongside the figures for the fuller record.

In the present matter another table is of some interest, namely, that showing the relationship of prostitution to religion.

TABLE VII. PROSTITUTION AND RELIGION.

	Roman Catholic.	Protestant.	Totals.	Percentages.	
				Roman Catholic.	Protestant.
Non-Prostitute . . .	124	107	231	75 %	66 %
Prostitute . . . . .	42	55	97	25 %	34 %
Totals . . . . .	166	162	328	—	—

It is clear, therefore, that the Roman Catholic inebriates are less frequently prostitutes than the Protestants.\* This might at first sight appear as if the Roman Catholic faith had a restraining influence, but we fear it is not possible thus to interpret it. The population from which the material is drawn has a large Protestant majority; there is therefore a larger percentage of alcoholists among the Catholics (? Irish); but the Protestant majority, whatever it may be, is certainly greater than the ratio of 55 to 42. In other words, out of the general population more than the proportionate number of prostitute alcoholists are drawn from the Catholics (? Irish). Why, therefore, do they show a less percentage of prostitution among their alcoholists? We fear the only answer that can be made is that alcoholism exists among the married and occupied Catholic (? Irish) women to a greater extent than among the Protestants. This is illustrated in the following table:—

TABLE VIII. CIVIL STATUS, PROSTITUTION AND RELIGION.

Status.	Roman Catholic.		Protestant.		Totals.	Number per 100,000.			
						Roman Catholic.		Protestant.	
	Non-Prost.	Prost.	Non-Prost.	Prost.		Non-Prost.	Prost.	Non-Prost.	Prost.
Married . . .	60	10	63	15	148	38	6	20	5
Widowed . .	14	4	11	6	35	9	3	3.5	2
Single . . .	50	28	33	34	145	32	18	10.5	11
Totals . .	124	42	107	55	328	79	27	34	18

We have taken the population of Liverpool as giving most Catholics. Here, judging from the report of the Education Committee, August, 1910, the children in Catholic schools were less than  $\frac{1}{3}$  of the whole population of children. Hence, as some Catholics may go to Council schools,† we have taken the ratio roughly as 1 to 2. On

\* The actual correlation obtained by a fourfold table is: —.135 between Catholicism and prostitution among convicted alcoholists.

† Dr. E. W. Hope informs me that the Roman Catholic children in the Council schools do not certainly exceed 0.4 per cent.



the Liverpool percentage of mentally defective and with the higher death-rate of alcoholics, 207 convicted alcoholists are drawn from a population of 296,474, and hence 328 from one of 469,775, of whom we should have 156,592 Roman Catholics and 313,183 Protestants. The second half of our table gives the returns for 100,000 Roman Catholic (? Irish) women and 100,000 Protestants of the number of convicted alcoholists of each status who would be prostitute and non-prostitute. We see at once that, while the prostitute element is greater for each status, the Roman Catholic total being 50 % higher than the Protestant, the non-prostitute Roman Catholic alcoholists are 132 % more than the Protestant. This is probably a question of race and stock; it shows, however, that the alcoholism spreads higher in the Roman Catholic than the Protestant communities from which Langho draws its material.\* It must indicate to the leaders of the Catholic section that they have a peculiarly difficult material to cope with in the Lancashire district. It is one which is the more difficult, because the Irish district of Liverpool—and it is probably a sample of other Irish immigrant communities in the industrial towns of England—is one of the few instances in which during the last twenty years there has not been a fall in the birth-rate. If, as we believe, extreme alcoholism flows from inferior mental capacity, and such capacity is hereditary, then the introduction of a selective birth-rate is the chief method by which this problem can be approached. The Catholic priest has an intimacy with his flock certainly not excelled, probably hardly equalled, by the minister of any other faith; can the Catholic leaders enlist his services in this the most pressing of eugenic problems—the diminution of hereditary mental defect?

It is worth while considering these results from another aspect. The distinction between the categories of Roman Catholic and Protestant may, as we have noted, be one of race, although ultimately religion itself is a matter of racial temperament. Whether our classification be one of race or not, the actual division, in broad lines, is one of the more excitable, more emotional, and more imaginative natures, as against the more cautious, the more phlegmatic, the more prosaic and quieter spirits. So much may probably be said without any danger of offence. In saying it, however, we are really drawing a division, broad and crude it is true, across a continuously varying characteristic of mankind, and this will apply whether our classification be actually one of race or of religious temperament. We have treated religion accordingly as a continuous variate marking a greater affectibility or excitability of temperament, and have calculated the correlations between it and other characters by two-row table or fourfold table methods with the following results:—

\* These are minimum values also, for we have taken Liverpool as our standard for the Langho data. In Manchester, from which much of the Langho material is drawn, Dr. Brown Ritchie informs us that the last quarterly Denominational Summary gave 102,932 and 17,910, Protestant and Catholic children respectively, or in the ratio of 5.75 to 1 instead of 2 to 1.

TABLE IX. CORRELATIONS, RELIGION, EDUCATION, CONVICTIONS, AND AGE.

Variates.	No.	Correlation.	Method Employed.	Remarks.
Age and No. of Convictions	328	$+.289 \pm .034$	Product Moment	(Table A)
Extent of Education and } F. E.	328	$-.300 \pm .034$	Two Row Table	A fourfold table gave
No. of Convictions				$-.234$ (Table B)
	E. E.	$-.445 \pm .037$	Two Row Table	
Extent of Education and } F. E.	328	$-.314 \pm .034$	Two Row Table	A fourfold table gave
Age				$-.350$ (Table D)
	E. E.	$-.094 \pm .046$	Two Row Table	A fourfold table gave
				$-.146$
Extent of Education and } F. E.	328	$-.225 \pm .035$	Fourfold Table	(Table F)
Intensity of Religious } E. E.	207	$-.376 \pm .040$	Fourfold Table	(Table F')
Affectibility				
Intensity of Religious Af- } 328		$-.082 \pm .037$	Two Row Table	This is insensible ; for
fectibility and Age				the sample of 152 it
				was $+.078$ (Table E)
Intensity of Religious Af- } 328		$+.225 \pm .035$	Two Row Table	(Table C)
fectibility and No. of Con- } 207		$-.135 \pm .037$	Fourfold Table	See remarks, p. 22.
victions				
Intensity of Religious Af- } 207		$-.135 \pm .037$	Fourfold Table	
fectibility and tendency } 207		$-.135 \pm .037$	Fourfold Table	
to prostitution				

In every case the correlations are between the increasing values of the variates.

In the face of the smallness of these correlations, it was perhaps hardly worth while testing the partial correlations, yet the values were calculated with the following results :—

Intensity of Religious Affectibility and Number of Con- victions for constant Age and constant <i>Formal</i> Education . . . . .	$+.213 \pm .035$
Intensity of Religious Affectibility and Number of Con- victions for constant Age and constant <i>Effective</i> Education * . . . . .	$+.110 = .046$
Extent of <i>Formal</i> Education and Number of Convictions for a constant Age and a constant Intensity of Religious Affectibility . . . . .	$-.173 \pm .035$
Extent of <i>Effective</i> Education and Number of Con- victions for a constant Age and a constant Intensity of Religious Affectibility . . . . .	$-.379 \pm .040$

Now these results show that the association between intensity of alcoholism and religious affectibility is little altered by allowing for the formal education ; it is about halved by allowing for the effective education ; that is to say, the religiously affectible have profited less by their education. On the other hand, the extent of formal education makes some, and the extent of effective education a considerably larger

\* This is on the basis of results obtained, where possible, by two-row table methods ; if we use, where possible, fourfold table methods the partial correlation is  $+.112$ , i. e. remains unchanged.



change in the number of convictions for a constant religion at a constant age. Can we therefore say that a profitable education has more influence over alcoholism than religious temperament? Not only can no such result be drawn from such small numbers as we have been able to deal with, but to draw it even from larger numbers would simply be to assert that every association is causation. We cannot take the easy line that the method of reducing extreme alcoholism lies simply in increasing effective education. That assertion would undoubtedly have been made a few years ago when education was looked upon as a panacea for alcoholism, crime, and commercial decadence. But what if both effective educability and alcoholism are the product of mental defect antedating both? The utter incapacity for receptivity which characterizes mental defect leaves not only the mind untrained but the emotions uncontrolled. Is it, then, mental defect rather than want of educational chances which is responsible for the recorded association between intensity of alcoholism and inferior education? This must form the subject of our next inquiry.

(8). *Relations of Mental Defect to Education, Age, and Alcoholism.* The feature of the extreme alcoholists, at any rate of the lower classes, which strikes the inquirer most strongly is the large number of mental defectives to be found among them. At the very outset we emphasized this (p. 18) by showing that the correlation between mental defect and extreme alcoholism lies probably between .7 and .8. We have further cited Dr. Branthwaite's general figures, and it will impress the reader still more if we put before him the returns for the last four years from Langho (*Report*, 1910).

TABLE X. MENTILITY OF FEMALE INEBRIATES AT LANGHO.

	1906.	1907.	1908.	1909.	Totals.	Percentages.
Insane . . . . .	1	3	1	2	7	3.1 %
Very Defective . .	3	4	3	4	14	6.3 %
Defective . . . . .	21	33	29	36	119	53.4 %
Normal . . . . .	11	26	18	28	83	37.2 %
Totals . . . . .	36	66	51	70	223	

We see from this table that 63 % of these women failed to reach a normal standard of intelligence; they are actually insane or mentally defective.\* The great problem of extreme alcoholism may indeed be summed up in the question: Is the large amount of mental defect associated with alcoholism in the female inebriates due to the alcoholism, or does the latter flow from a pre-existing want of mental capacity? Such a table as the above thrusts this problem directly upon the inquirer, and

\* There appears to be but slight change going on in this percentage; in 1906 it was 69 %, in 1907 61 %, in 1908 65 %, and in 1909 60 %. These are, however, possibly only variations due to small samples.

yet we find whole treatises on alcoholism which have never faced this fundamental question. Finding feeble mentality associated with alcoholism, their authors invariably attribute it to the alcoholism.

The three fundamental correlations on this point are those between education, age, and mental capacity in alcoholists (Tables G, G', D, D', R, and V). We were only able to obtain 207 cases of combined education and mental capacity, and they were thrown into a fourfold table (Tables G<sup>bis</sup> and G'<sup>bis</sup>) of mental capacity, normal and defective, with education, better and worse. We have, of course, results for both formal and effective education, and they provide the following correlations:—

TABLE XI.

Variates.	Method.	No.	Correlation.
Mental Capacity and Extent of Formal Education . .	Fourfold	207	+·341 ±·038
Mental Capacity and Extent of Effective Education . .	Fourfold	207 *	+·644 ±·027
Extent of Formal Education and Age . . . . .	Two Row	207 †	—·314 ±·042
Extent of Effective Education and Age . . . . .	Two Row	207	—·094 ±·046
Extent of Effective Education and Physique . . . .	Fourfold	207	+·450 ±·037
Mental Capacity and Age . . . . .	Fourfold	207	—·062 ±·047

These results are, without being final, very striking. Among alcoholists there is practically no sensible decrease of mental capacity with age. We might have anticipated that if mental defect were a product of alcoholism, the alcoholists would have grown more mentally defective as they grew older. This is not markedly the case; the correlation, having regard to its probable error, is not sensible. While age is related to formal education, a result, as we have indicated, probably due to the older alcoholists having spent their childhood before the days of compulsory education, it is very slightly related to effective education. This is precisely what we should expect if the effective education in the classes from which these alcoholists are drawn depends really on their receptivity in childhood. Formal education is only half as closely related to mental defect as effective education, which is very closely related. It is difficult to understand why this close relationship should hold, if effective education depended on the receptivity of childhood and mental defect were a consequent of adult alcoholism.

If our view be correct, that the high correlation between formal education and age is solely due to the Education Act and not to decay of education as a result of mental defect following alcoholism, we ought to get much the same result for the correlation between age and education for a constant mental capacity. We find:—

\* A lower value was obtained by mean-square contingency, but we were only able to make a four × four contingency table, which gave  $C_2 = .415$ .

† Worked out by a two-row table on 328 cases it was —·341 instead of —·314. A fourfold table gave the result —·350 ±·033. All these are in good agreement.



Extent of *Formal* Education and Age for a constant  
mental capacity . . . . . =  $-.312 \pm .042$

Extent of *Effective* Education and Age for a constant  
mental capacity \* . . . . . =  $-.071 \pm .047$

The former result shows that mental capacity does not sensibly influence the relation between formal education and age, i. e. confirms the view that the relationship is one of external conditions. The latter result shows that the influence of mental capacity is equally insignificant in its action on the inappreciable relation between effective education and age. Mental capacity decreasing with age is thus not a possible explanation of any relation between education and age. The facts are precisely what we might expect, if mental defect antedated alcoholism; the education of the individual of this class is completed before the age at which alcoholism sets in, and although the estimate of education might be to some extent influenced by the existing condition of the inebriate, yet the grade of education on either basis is in the main determined by conditions and characteristics fully settled before the onset of alcoholism. It is thus all the more remarkable that the correlation of effective education and mental capacity—mental capacity having been asserted to be largely influenced by the alcoholism—should be one of the highest we have reached in this investigation.

We can further illustrate this point by asking what is the correlation of mental capacity and age for a constant grade of education. We find:—

Mental Capacity and Age for a constant extent of formal  
education . . . . . =  $+.050 \pm .047$

Mental Capacity and Age for a constant extent of effective education † . . . . . =  $-.006 \pm .047$

There is only one conclusion to be drawn from these results, namely, that if the alcoholists be compared grade for grade as regards education, there is no relation whatever between their mental capacity and their ages. Yet if mental defect were a consequent of alcoholism, it should steadily increase with the age of the alcoholic. Nothing of this nature is manifest in the Langho data.

Lastly, let us look at the third partial correlation, the relation between education and mental capacity for a constant age. We should anticipate that if mental capacity is largely affected by length of alcoholism, that the partial correlation co-efficients between mental capacity and education would differ much from their absolute values. We find:—

\* If we use the contingency value .415 (see footnote, p. 26) we find for the partial correlation  $-.075 \pm .047$ , sensibly the same value as above.

† Using the contingency value .415 (see footnote, p. 26) we have this partial correlation  $-.025 \pm .047$ , or again insignificant.

## Extent of Formal Education and Mental Capacity

for a constant age . . . . . = + .340  $\pm$  .041

## Extent of Effective Education and Mental Capacity

for a constant age\* . . . . . = + .642  $\pm$  .028

The absolute values are +.341 and +.644.

These results show that the relation between education and mental capacity is for the quite young alcoholicist sensibly as intense as for the old alcoholicist, or for the whole body of alcoholicists. It is impossible to accept this unless we conclude that the mental defect is an antecedent and not a consequent of the alcoholism.

As some confirmation of this view, the correlation between extent of education and mental capacity for a constant intensity of alcoholism (i.e. a constant number of convictions) and a constant age has been worked out. We find:—

## Mental Capacity and Extent of Formal Education

for constant age and constant alcoholism . . . = .296  $\pm$  .043

## Mental Capacity and Extent of Effective Education

for constant age and constant alcoholism . . . = .608  $\pm$  .030

Thus we may say that the gross correlations between education and mental capacity are .34 and .64 for the two kinds of education, and when corrected for age and alcoholism are  $.30 \pm .04$  and  $.61 \pm .03$ . These differences are scarcely significant, but if we give any weight to them we can only say that the effect of alcoholism does not modify the relation of mental capacity and effective education by more than  $\frac{1}{20}$  of its value. It is extremely difficult in the light of such results and those previously indicated to believe that the mental defect in these cases of extreme alcoholism is a consequent of the alcoholism; the only reasonable conclusion is that the mental defect to at least  $\frac{19}{20}$  of its value antedates the alcoholism.

(9) *Relation of Civil Status to Prostitution and Intensity of Alcoholism.* We have already indicated that the Langho statistics do not enable us to deal with the problem of want of occupation in relation to alcoholism. If want of occupation leads to alcoholism, it is in a class from which these convicted alcoholicists are not drawn. There is only one case of a female alcoholicist of independent means recorded in the Langho data, and where no entry of occupation is made, the woman was a prostitute. This introduces a cross-division into our tables, for unpleasant as the recognition may be to some, we have to admit prostitution as a profession, occupation, or calling on the one hand, and when we proceed to deal with a sub-population like that of convicted alcoholicists, where 30 % are prostitutes, we are bound on the other hand to treat the prostitute as having a special civil status. What possible meaning can a division into married, widowed, and single bear if we neglect the fact that 17 % of the married, 28 % of the widowed, and 43 % of the single are prostitutes?

\* If the contingency value .415 is used (see footnote, p. 26) the partial correlation is .412, which again is sensibly the same as the uncorrected value.



The civil status has only social or economic value, when the status of prostitute is excluded or forms so small a percentage of the married, widowed, or single as not to stultify any conclusions drawn from our classification.

TABLE XII. CIVIL STATUS AND EMPLOYMENT. (SEE TABLES H AND I.)

	Employed.	Prostitution.	Independent Means.	Housewives.	Totals.
Married . . .	84	25	—	39	148
Widowed . . .	25	10	—	—	35
Single . . .	82	62	1	—	145
Totals . .	191	97	1	39	328

The Langho numbers are too few to break up with any prospect of good result the class of employed, which covers a variety of industrial, domestic, and commercial occupations. With much larger numbers some instructive results might be obtained from such differentiation. Our next table gives the relation of occupation and civil status to age and the intensity of alcoholism. This table at once indicates that not only are the prostitutes the younger women, but that they have the greater number of convictions; the widows alone stand higher in the number of convictions. The single woman has 50 % more convictions than the married woman, and the prostitute

TABLE XIII. OCCUPATION AND CIVIL STATUS. MEAN AGES AND NUMBER OF CONVICTIONS.

Occupation.	Mean Age.	Mean No. of Convictions.	Civil Status.	Mean Age.	Mean No. of Convictions.
Housewife . .	40.00	20.05	Single . . .	31.86	32.07
Employed . .	36.85	28.21	Married . . .	38.68	22.79
Prostitute . .	33.86	31.71	Widowed . .	45.44	35.14
Totals . .	36.39	28.21	Totals . .	36.39	28.21

Standard Deviation of ages = 9.52 years. Standard Deviation of convictions = 28.54 convictions.

50 % more than the housewife. How far this is due to the protection of home, or to the fact that the more mentally defective are more likely to remain single, will be dealt with later. It is clear that if the widows were omitted we should find a negative correlation between age and number of convictions; the widows indeed form an anomalous group, with the highest number of convictions. They are closer to the single women than to the married women, in their number of convictions, and are intermediate in the extent of prostitution. If we deducted from the married women those 17 % who are prostitutes, we find a lower number of convictions, 21.66, for non-prostitute married women. This is very slightly greater than that for housewives; the difference is indeed so slight that it might easily be reversed with more ample statistics; in other words, there is no markedly greater intensity of

alcoholism in married women occupied in their homes than in those who go to outside occupation.

While both as to age and conviction the means of Table XIII have not only apparent, but really significant differences, yet these differences do not mark as high a degree of association as the reader might anticipate, if he paid no attention to the large values for the standard deviations of both age and number of convictions recorded under the table. These lead us in several cases to relatively small correlations. In order to obtain some appreciation of the degree of association involved between prostitution, status, age, and alcoholism, we have divided the inebriates into two groups, the prostitute, and the non-prostitute, which latter includes housewives and employed. This seems fairly reasonable when we examine the age-means, but less satisfactory from the standpoint of convictions. However, the determination of the correlation coefficient did not suggest that this grouping would lessen the association. In the case of civil status we saw less chance of a graded and continuous variate underlying the idea of status than in the case of the factors which impel a woman to professional prostitution. When dealing with age, single, married, widowed, present the only possible order, and a line may be drawn between single and the married together with the widowed; thus marking a distinction between once and never-married. In the case of convictions, however, single and widowed appear to fall more naturally into a single group contrasted with married, the contrast being that of a woman without or with a permanent link to a more or less responsible male. With the above divisions the following correlations resulted:—

TABLE XIV. CORRELATION OF CIVIL STATUS AND EMPLOYMENT WITH AGE AND NUMBER OF CONVICTIONS.

Characteristics.	Correlation.	Method.	No. of Cases.	Remarks.
Prostitution and Convictions	$+0.105 \pm 0.037$	Two-row table	328	More prostitution, more convictions
Prostitution and Age	$-0.227 \pm 0.035$	Two-row table	328	More prostitution, less age
Prostitution and Status	$-0.413 \pm 0.031$	Fourfold table	328	More marriage, less prostitution
Status and Convictions	$-0.217 \pm 0.035$	Two-row table (single and widowed)*	328	More marriage, less convictions
Status and Age . . .	$+0.533 \pm 0.027$	Two-row table	328	More marriage, greater age
Convictions and Age .	$+0.289 \pm 0.034$	Product moment	328	More convictions, greater age

These correlations indicate, of course, that the single woman and the prostitute have the greater intensity of alcoholism as measured by the number of convictions, but they do not show such an intensity of relationship as would lead us to put great stress on either prostitution or civil status as an important factor in the production of extreme alcoholism. It seemed worth while, however, ascertaining how far civil

\* Married and widowed together gave  $-0.182$ , and the correlation ratio (hardly legitimate for a three-rowed table) gave the same value.



status and age contribute to the relationship of prostitution to alcoholism. The value of the correlation between prostitution and convictions when corrected for constant age and civil status is  $.025 \pm .037$ , or on our data is non-significant. In other words the prostitute alcoholic relatively to the non-prostitute is only more alcoholic owing to her age and the fact that she is less frequently married. As far as our material extends we cannot assert that the somewhat greater alcoholism of the prostitute is due to the fact of prostitution; it appears due to the fact that she is differentiated from other alcoholists in age and civil status. Some light may be thrown on this point by examining Tables XV and XVI, which exhibit the relationship of Civil Status and Prostitution to Mental Defect. The mentality is unfortunately only known for the 207 cases; the mean ages are given from the 328 cases.

TABLE XV. CIVIL STATUS AND MENTAL CAPACITY. (SEE TABLE Y.)

Status.	Crude Numbers.		Totals.	Percentages.		Mean Ages.
	Normal.	Defective.		Normal.	Defective.	
Single . . .	41	57	98	42 %	58 %	31.86
Married . . .	39	48	87	45 %	55 %	38.68
Widowed . .	12	10	22	55 %	45 %	45.44
				47 %	53 %	
Totals . .	92	115	207	44 %	50 %	36.39

This table shows that the percentage of mental defect among the married women is somewhat less than among the single women; thus the single women have somewhat more mental defect, just as they have a great number of convictions and are younger.

TABLE XVI. PROSTITUTION AND MENTAL CAPACITY.

Prostitution and Civil Status.	Crude Numbers.		Totals.	Percentages.		Mean Ages.
	Normal.	Defective.		Normal.	Defective.	
Employed { Single . . .	17	28	45	38 %	62 %	37.47
and { Married and	38	40	78	49 %	51 %	
Housewives { Widowed }				45 %	55 %	
Prostitutes { Single . . .	24	29	53	45 %	55 %	33.86
{ Married and	13	18	31	42 %	58 %	
{ Widowed }				44 %	56 %	
Totals . . . . .	92	115	207	44 %	56 %	36.39

This table, if we trust to its small numbers, shows some very remarkable points. If, firstly, we consider the problem apart from status there is scarcely any relation between prostitution and mental defect *within the group of convicted alcoholists*. The prostitutes are not the markedly more mentally defective section of the extreme alcoholists. Secondly, however, we note that if status be taken into account, there

is an apparent differentiation with regard to intelligence. The alcoholic prostitutes who are single women are less mentally defective than the alcoholic single women who are not prostitutes, but the married and widowed women who are prostitutes are more mentally defective than the same class who are not prostitutes. In other words, it would appear that employed single mentally defective women and prostitute married mentally defective women become inebriates in larger proportions. Does this signify that the married women who become prostitutes have been largely deserted owing to their mental defect, and that mental defect in the wife does not so readily lead to convicted alcoholism as in the case of the occupied single woman? It must, of course, be remembered that all the statements made are purely relative; in all the categories there is an overwhelming amount of mental defect. The occupied single woman may come more into unguarded contact with the outer world and its alcoholic possibilities, while the prostitute single woman requires more intelligence to follow for any time her difficult calling. We need to know far more about the individual lives of both of these alcoholic classes before any final explanation can be offered, and the problem requires to be considered on far larger numbers. But the suggestions that flow from the Langho data are (i) that the single-women inebriates are on the average younger, more mentally defective, and have had more convictions than the married inebriates, and (ii) the line drawn across the alcoholists between prostitute and non-prostitute does not correspond to any marked distinction between greater and less mental defect.

In the following table we place the correlations of prostitution with a number of other characters for our 207 sample :—

TABLE XVII. CORRELATION OF PROSTITUTION WITH OTHER CHARACTERISTICS.

Variates.	Correlation.	Method.	Remarks.
Prostitution and Mentality . .	— .028 ± .046	Fourfold	Non-significant
Prostitution and Good Physical Condition	+ .045 ± .046	Fourfold	Non-significant
Prostitution and Good Conduct	— .250 ± .043	Fourfold	Prostitutes are the more troublesome alcoholists
Prostitution and Effective Education	+ .348 ± .041	Fourfold	The prostitute has a better education than the non-prostitute

Among alcoholists the prostitute has neither a worse mentality nor physique than the non-prostitute. She has also a better effective education. She is, however, worse behaved or more troublesome in the reformatory. It is difficult in the face of these facts to assert alcoholism as an antecedent to prostitution and mental defect. The greater alcoholism of the prostitute inebriate has not produced a worse physique or greater mental defect.\* She is more troublesome although she has had a better

\* For a constant alcoholism, i. e. number of convictions, the correlation of prostitution and mental defect = .000.



education. We need more data to unravel these complexities, but they smack more of hereditary than environmental products.

(10) *On the Relations of Mental Condition and Physical Condition to the Intensity of Alcoholism.* For these relations we have only the record of 207 cases, so that due regard must be paid to the magnitude of the probable errors. Reasonably reliable results will only be reached when at least 1,000 inebriates have been recorded and tabled in the same way.

Treating first the correlation between age and number of convictions for these 207 cases we find  $r = .288 \pm .034$ ; for the 328 cases (see p. 24) it was .289. The agreement is so good that we have not thought it needful to reproduce the Table.

TABLE XVIII PROVIDES THE RELATIONS BETWEEN THE VARIOUS CHARACTERS.

Variates.	Correlation.	Method.	Remarks.
Number of Convictions and Age	$.288 \pm .034$	Product Moment	Greater age, more convictions (Table A)
Number of Convictions and Mental Condition Age and Mental Condition .	$-.267 \pm .034$	Two-row Table	More mental defect, more convictions (Table L)
	$-.062 \pm .037$	Two-row Table	Greater age, more mental defect (Table R)
Number of Convictions and Physical Condition Age and Physical Condition	$-.171 \pm .036$	Two-row Table	More convictions, less fit (Table M)
	$-.417 \pm .031$	Two-row Table	Greater age, less fit (Table S)
Mental and Physical Conditions	$.549 \pm .026$	Fourfold Table	Mentally defective, less fit (Table O)

Now these correlations show at once some interesting results. (i) The physical condition is very sensibly correlated with age, but (ii) this is not so with the mental condition, which does not get sensibly worse with age. Now we have seen that number of convictions is sensibly correlated with age. Let us remove this influence and see how mentality and physique are correlated with age. We find for the partial correlation co-efficients:—

Correlation of Mental Condition and Age for constant

number of convictions . . . . .  $\rho = + .016 \pm .045$ .

Correlation of Physical Fitness and Age for constant

number of convictions . . . . .  $\rho = - .390 \pm .031$ .

The first correlation is sensibly zero, or we see that age—within the limits of the ages of these inebriates, 16 to 69—produces very little effect on the mental condition. We might anticipate that as convictions increase with age we should find a sensible change made, when we allow for convictions. But this is not so; the mental condition changes little with age independently of convictions and hardly more sensibly, if convictions be taken into account. On the other hand, for a constant

number of convictions there is still a very sensible deterioration in physique with age. In other words, for a given intensity of alcoholism, age seems to have little influence on the mental capacity, but a good deal on the physique.\* Now let us turn the problem round and ask whether for a given age the number of convictions is highly correlated with the mental capacity or the physique. We find:—

Correlation of Number of Convictions and Mental Capacity

for a given age . . . . .  $\rho = -.260 \pm .035$ .

Correlation of Number of Convictions and Physical

Fitness for a constant age . . . . .  $\rho = -.059 \pm .037$ .

The latter result seems to indicate that the physique at a given age is not much influenced by the intensity of the alcoholism as measured by the number of convictions. The physical fitness is far more influenced by the advance of age than by the number of convictions. On the other hand, the mental capacity appears little influenced by age, but is more sensibly associated with the number of convictions. Is it to be inferred, then, that alcoholism produces relatively small effect on the physique, † and a much larger effect on the mental condition? Is it not more consonant with reason to suppose that the association between intensity of alcoholism and mental defectiveness does not lie in increased alcoholism producing increased mental defect, but that it is the mental defect which determines the amount of the alcoholism, or the greater mental incapacity which at any rate leads to the greater number of convictions? It seems highly improbable that the alcoholism can deteriorate the mind without first or at the same time deteriorating the body; and this view receives additional confirmation from the fairly high correlation, .549, which we have found between mental and physical fitness in these inebriates, a correlation which if taken for constant age rises to the still higher value of  $.577 \pm .025$ .

(11) *On a Second Method of measuring Alcoholic Intensity.* Thus far we have supposed that the simple number of convictions is a measure of the amount of alcoholic detriment to which the individual has been subjected. It may, however, be suggested that the like number of convictions spread over a large number of years will not measure the same alcoholic tendency as if they were concentrated into a few years. We are not able to accurately measure the number of convictions, nor do we know the age at which the first conviction occurred. But our alcoholists range in age from 16 to 69, and if  $c$  be the number of convictions,  $y$  the excess in years of the individual over 16, then  $c/y$  will be some, if a rough, measure of the concentration of alcoholism. To save the labour of re-working all the correlations on the basis of what is only a rather crude measure, and to determine what influence the concentration of

\* An attempt is made below to measure "intensity of alcoholism" rather differently.

† It must be remembered that the physique is here measured by the test of fitness to do hard work when in the inebriate reformatory, and not by the condition when in a state of alcoholism. It is of much interest to note that physical fitness is fairly highly correlated with effective education (.450); again we find a pre-alcoholic character associated closely with one supposed by the writers on this subject to be largely controlled by the intensity of the alcoholism.



alcoholism has, approximate formulae were worked out expressing the correlation of  $u = c/y$  in terms of statistical constants already calculated.

Clearly if  $a$  be the age, a bar denote as usual a mean value, and  $v$  a coefficient of variation :—

and approximately  $\bar{y} = \bar{a} - 16, \quad \sigma_y = \sigma_a, \quad v_y = \sigma_y/\bar{y} = \sigma_a/(\bar{a} - 16),$

$$\bar{u} = \frac{\bar{c}}{\bar{y}}(1 + v_y^2 - v_y v_c r_{yc}), \quad v_u^2 = v_c^2 + v_y^2 - 2v_y v_c r_{yc}$$

where accurately  $r_{yc} = r_{ac}$ .

Let  $z$  be any character, which we may put either =  $m$  the mental capacity, or =  $p$  the physical fitness. Then

$$r_{uz} = (v_c r_{cz} - v_y r_{az})/v_u,$$

$$r_{ua} = (v_c r_{ca} - v_y)/v_u,$$

$$r_{uc} = (v_c - v_y r_{ac})/v_u.$$

The partial correlations of the character  $z$  with the age and number of convictions for a constant  $u$  will be given by :

$${}^u\rho_{za} = \frac{r_{za} - r_{uz}r_{ua}}{\sqrt{1 - r_{uz}^2} \sqrt{1 - r_{ua}^2}},$$

$${}^u\rho_{zc} = \frac{r_{zc} - r_{uz}r_{uc}}{\sqrt{1 - r_{uz}^2} \sqrt{1 - r_{uc}^2}}.$$

These may be expressed in terms of the original co-efficients as follows :—

$${}^u\rho_{za} = \frac{v_c(r_{az} - r_{cz}r_{ca}) + v_y(r_{cz} - r_{az}r_{ac})}{\sqrt{1 - r_{ac}^2} \sqrt{v_c^2(1 - r_{cz}^2) + v_y^2(1 - r_{az}^2) - 2v_c v_y(r_{ac} - r_{az}r_{cz})}}$$

$${}^u\rho_{zc} = \frac{v_y(r_{cz} - r_{az}r_{ac}) + v_c(r_{az} - r_{ac}r_{zc})}{\sqrt{v_c^2(1 - r_{cz}^2) + v_y^2(1 - r_{az}^2) - 2v_c v_y(r_{ac} - r_{az}r_{cz})} \sqrt{1 - r_{ac}^2}}$$

$$= {}^u\rho_{za}, \text{ as we should } a \text{ priori anticipate.}$$

Hence all we need determine for these partial co-efficients are :— ${}^u\rho_{ma} = {}^u\rho_{mc}$  and  ${}^u\rho_{pa} = {}^u\rho_{pc}$ .

The following table gives the value of the chief numerical constants needful :—

TABLE XIX.

	Mean.	Standard Deviation.	Coefficient of Variation.
$a$	$\bar{a} = 35.82$	$\sigma_a = 9.359$	$v_a = .2613$
$y$	$\bar{y} = 19.82$	$\sigma_y = 9.359$	$v_y = .4722$
$c$	$\bar{c} = 28.34$	$\sigma_c = 15.828$	$v_c = .5585$
$u$	$\bar{u} = 1.64$	$\sigma_u = 1.0152$	$v_u = .6190$

TABLE XX. CORRELATIONS.

$m$	$r_{um} = -.1935$	$r_{ua} = -.5031$	$r_{uc} = +.6826$
$p$	$r_{up} = +.1638$	${}^u\rho_{ma} = {}^u\rho_{mc} = -.1875$	${}^u\rho_{pa} = {}^u\rho_{pc} = -.3918$
	${}^a\rho_{mp} = +.6003$	${}^a\rho_{mu} = -.2605$	${}^a\rho_{pu} = -.0586$
	${}^a\rho_{mp} = +.5768$	${}^c\rho_{mu} = -.0159$	${}^c\rho_{pu} = +.3845$

The results for  ${}_a\rho_{mu}$ ,  ${}_a\rho_{pu}$ ,  ${}_c\rho_{mu}$ ,  ${}_c\rho_{pu}$  should, of course, be identical—the last two with the signs changed—with those found for  ${}_a\rho_{mc}$ ,  ${}_a\rho_{pc}$ ,  ${}_c\rho_{ma}$ , and  ${}_c\rho_{pa}$  on p. 33. The excellent accordance between the results shows us that the approximate formulae are reliable.

The results as a whole, however, only add slightly to our knowledge, and this in the following manner:

(i) The average annual number of convictions is 1.7, and the distribution of these annual numbers of convictions is clearly very skew, i. e.  $\sigma_u$  is a large relative to  $\bar{u}$ , so that the range of variation is largely on the excess side of the mean.

(ii) The relation between mental condition and the annual number of convictions is less close than the relation between mental condition and the total number of convictions; the relation between physical condition and annual number of convictions is *positive*, whereas the relation between physical conditions and total number of convictions is negative. The only explanation that we can put upon these facts is that the total number of convictions is more important than the period over which they are spread; if that period be short, it means that the age of the inebriate is less and accordingly the physique better, hence the positive correlation. Both correlations seem to suggest that the total amount rather than the concentration of the alcoholism is the important factor.

(iii) The relation of physical condition to age is less for a constant annual number of convictions than for a constant total number of convictions, being only about half as much.

(iv) Finally the relations between annual number of convictions and age and number of convictions are noteworthy. If the annual number of convictions were a vital factor of alcoholism, we should expect it to have little relation to age, yet we see that when the age is great, the annual number of convictions is small, and when the age is low the annual number is great. Again we should not expect if the annual number of convictions were the essential variate of alcoholism, that it would be highly correlated as it is with the total number of convictions. In fact the values for  $r_{ua}$  and  $r_{uc}$  are precisely of the character we should anticipate, if there were little dependence of  $c$  on  $a$ , i. e. if  $r_{ac}$  were small; for in this case the correlations of the ratio  $c/a$  with  $a$  and  $c$  would take considerable negative and positive values,—thus satisfying the theory of spurious correlation.

It is quite possible that, if we had more elaborate records giving the age at onset of the alcoholism and the exact number of convictions, the correlation of the number of convictions and the years of alcoholism would be far higher, and accordingly the annual number of convictions might be a valuable measure of the intensity of the alcoholism. As it is, we do not know the age at onset, nor the true number of convictions, and our approximation to its value seems for the reasons given above to be less significant than the crude number of convictions.

The correlation given above ( ${}_a\rho_{pu}$ ) shows that for a constant age the number of



convictions per year has no sensible effect on the physique. There is, however, quite a sensible correlation between mental defect and the number of convictions per year for a constant age ( $a\rho_{mu}$ ). This result is in agreement with the fact that 78 % of the women at Langho with an average number of 27 convictions against them are physically fit for hard work,\* while 63 % of women with an average number of 33 convictions against them are mentally defective, or practically incapable, even when sober, of guiding their conduct. We still face the problem of whether this large proportion of mental defectives—immensely greater than we find in the general population—is due to the alcohol, or whether it is the pre-existing mental defect which leads to the alcoholism, and which possibly is to some extent exaggerated by it.

We cannot profess to answer this problem finally on the data of the present section. It probably can only be answered when we have ample records relating to those inebriates who have been recommitted to reformatories at considerable intervals. But certain points should be kept in view even if the judgement be suspended.

(i) Mental defect is, in many stocks at least, of an hereditary character. It is further interchangeable in heredity with a variety of other degeneracies, e. g. insanity, alcoholism, &c.

(ii) While alcoholism is often associated in the same individual with either insanity or mental defect, it occurs also in individuals of insane and mentally defective stocks, who are not themselves either insane or mentally defective.

(iii) While mental defect is highly correlated with physical unfitness, we do not find, as we should expect if mental defect were caused by the alcoholism, a physical deterioration going on at the same rate.

(iv) A large proportion of criminals (45 %) are mentally defective, and the number of convictions in that case also is correlated with the mental unfitness.

We hardly speak of crime producing mental defect, but of the mental defect leading to the criminality; it appears not improbable that alcoholism as measured by number of convictions is of the same character; both are due to the want of will-power and of self-control, which flow from the absence of mental balance, i. e. from the mental defect, rather than themselves productive of it.

The investigations given in this section are far too slender to demonstrate the views indicated, but they are far from opposed to them, and a study of the pedigrees of degenerate stocks certainly supports this interpretation. From this view-point want of education is not a source of alcoholism, nor is mental defect its product. It is the excitable, emotional, mentally uncontrolled nature refusing education or not assimilating it which becomes alcoholic, and the more mentally defective it is,

\* The actual proceeds of the industrial occupations of the 70 women for the year 1909 at Langho were £1,478, or an average of £21 apiece, if we reckon it on the total, whether physically fit or not for hard work. This result speaks not only well for the management, but for the relative physical fitness of the inmates.

the more alcoholic it will be. Only when the inebriate reformatories are made national laboratories for studying on a uniform system the present and the past histories of the alcoholic, shall we have sufficient material upon which true answers to the problems suggested can be reached.

(12) *On the Relation of Conduct to Alcoholism and Mental Defect.* One of the characters recorded in the reformatory is that of behaviour, and we believe that much might be learnt from a somewhat fuller consideration of the temperament and temper of the inebriates. A full investigation of these points would throw much light on the mental traits of the women who ultimately become inebriates. As a matter of fact, the bare record of conduct in the reformatory shows much of great interest; thus\* only 9 % of the women are really troublesome, although only 71 % are classed as "well-behaved", the remaining 20 % falling into the class of "manageable", which we interpret as meaning that these women can be managed with tact, although they need special attention. The smallness of the category of "troublesome" and "very troublesome" cases has compelled us to make only the two categories of "well-behaved" and "not well-behaved", but when the records cover thousands of cases, not a couple of hundreds, this must, and can easily be, modified.

Tables N, Q, and T give the material for a judgement as to the inter-relationships of conduct with other characters.† First as to age and convictions, we have the following results (see Tables N and T):—

TABLE XXI.

	Well-behaved.	Manageable.	Troublesome.
Mean Ages . . . . .	37.03	33.16	32.18
Mean Number of Convictions . .	25.78	35.07	34.05

It is thus clear that both in age and number of convictions the "manageable" differ much more from the "well-behaved" than they do from the "troublesome". The "troublesome" and the "manageable" are 4 to 5 years younger women, and they have had 30 % to 40 % more convictions than the well-behaved. We are thus justified in putting these two classes together, and we see that the women who are "well-behaved" are rather the older women and those with a smaller police-court record. It may be said, and is very likely to some extent true, that they have had longer experience of prison and reformatory discipline and that this accounts for their conduct. This would not, however, account for their fewer convictions. If, however,

\* Cf. the numbers given on p. 10, footnote, for longer series.

† It must be remembered that, as in the case of the mental and physical conditions, this is conduct when out of reach of alcohol. In judging the conduct of the inebriate in practical life outside the reformatory we are too apt to compare conduct before or in the early stages of alcoholism with that of the individual in a chronic state of alcohol. To judge the deterioration produced by alcohol, we must judge conduct before and after in a state of sobriety.



a somewhat greater factor of self-control be the source of their better conduct, this would explain their smaller number of convictions. The lessening of the intensity of emotions and sensual passions with age, a lessening which renders the reformatory discipline less irksome, would in all probability sufficiently account for the greater age of the "well-behaved".

We now turn to the correlations of conduct with other characters. (See Tables T, N, P, P<sup>bis</sup>, Q, Q<sup>bis</sup>.)

TABLE XXII.

	Correlation.	Method.	Remarks.
Good Conduct and Age . .	+ .269 ± .034	Two-row Table	Well-behaved, older (Table T)
Good Conduct and Number of Convictions	− .206 ± .035	Two-row Table	Well-behaved, fewer convictions (Table N)
Good Conduct and Mentality	+ .486 ± .028	Fourfold Table	Well-behaved, less defective (Table P <sup>bis</sup> )
Good Conduct and Physique.	− .256 ± .035	Fourfold Table	Well-behaved, less fit (Table Q <sup>bis</sup> )
Good Conduct and Education	+ .363 ± .040	Fourfold Table	Well-behaved, better educated

Now these results as they stand are of very considerable interest. The well-behaved women are the older, the less-often convicted, the better educated, the more intelligent, and the feebler in physique; the troublesome women are the younger, the more often convicted, the more mentally defective, but the physically stronger.\* These conclusions are the more instructive because we have found a very considerable correlation between mental and physical fitness in these inebriates. Yet in percentages we see from Tables Q<sup>bis</sup> and P<sup>bis</sup> that while 25 % of the "well-behaved" are unfit for hard work, only 13 % of the "troublesome" are incapable of it; on the other hand only 46 % of the "well-behaved" are "mentally defective", while 78 % of the "troublesome" are thus deficient. This remarkable fact—that it is the physically fitter and younger group of women who show the greater intensity of alcoholism as measured by number of convictions, behave worse, and are more mentally defective—seems to emphasize the view that the extreme forms of alcoholism are the result of a strong physical nature under little mental control, and that defective mentality is not so much the outcome as one of the chief factors contributing to extreme alcoholism.

(13) *Conclusions.* The writers of this paper are fully conscious of the slenderness of their data; they have themselves stated that many of their conclusions are probabilities or suggestions rather than demonstrations. They will no doubt be upbraided with publishing anything at all, either on the ground that what they are dealing with is "crude and worthless material" or that as "mathematical outsiders"

\* The prostitutes, as we have seen, are the younger and the more troublesome, but a cross-current is seen when we note that they are not more mentally defective and are better educated.

they are incapable of dealing with a medico-social problem.\* They, on the contrary, believe that the material collected by Dr. Gill at Langho is of very great value and on that very account want to see it immensely increased in volume and fuller in detail.† The chief object indeed in the publication of this paper is to draw attention to the need for the publication of detailed accounts of each individual inebriate. The great work recently undertaken by H.M. Prison Commissioners in the study of the physique, mentality, and family history of the criminals in their charge ought to be extended to the inebriates and ultimately to the insane. The prisons, the asylums, and the inebriate reformatories form in combination a great national laboratory for the study of those degeneracies upon the limitation of which the welfare of society so largely depends. We do not want more emotional writings or more verbal disquisitions about the criminal, the insane, and the alcoholic. We need above all things to create a school with the requisite social, medical, psychological, and statistical training, which will set to work and study their physique, their mentality, their family history, and their past environments. In this matter we are sadly behind even a poor land like Spain. In Madrid attached to the University is a school of criminal anthropology and psychology, and there the medical prison officer and the prison governor must graduate before entering on their professional careers. The prisons of Madrid are open to the professors and their students, of course under special regulations, and even as the wards of the hospitals provide clinical material for the academic study of medicine and surgery, so the prison becomes a laboratory for the study of criminology. The inebriate reformatory ought in the same way to be regarded not only as a place for the seclusion and possibly the reformation of the alcoholic, but as a laboratory where material may be collected, upon which a really scientific knowledge of alcoholism may be based. At present there is much declamation, endless prejudgement, and, with a few noteworthy exceptions, little genuine study of alcoholism; the very data upon which sound judgements could be based are either wanting, or, if existing, defective in character, and too few to give final conclusions.

We are told, and we believe it to be true, that the record of past convictions is extremely imperfect. The women with whom we are here dealing are largely migratory,

\* One critic of the recent Eugenics Laboratory memoir on alcoholism, who describes himself as a Fellow of the Royal Statistical Society, apparently considers that our attempt to study alcoholism statistically is a sign of our "drug indulgence." He writes: "that the educated man and the scientist is as prone as any other to become the victim (often the unconscious victim) of his prejudices. When these prejudices centre round a drug like alcohol which entwines itself [*sic*!] into the sensuous side of man's nature he will in defence thereof make shipwreck of both the facts of science and the methods of science, and devote himself to the defence of his drug indulgence, even in what is called moderation, by perpetrating every form of fallacy, inaccuracy, and distortion"; he continues by telling us that it is only prejudice and passion which can extract proofs out of such material as we have used, and concludes by citing Pope's "The ruling passion conquers reason still." It would be franker if this gentleman stated his conviction that we must be inebriates!

† The large admixture of Irish at Langho may also weight certain features of the analysis.



and may have different names and separate police records in several localities. This renders it as hard to obtain a record of the extent of the worst type of inebriety as it is to ascertain the total number of persons in the country who have been at any time of their life certifiably insane. As in the case of the insane, so in the case of confirmed inebriety, a central registry with an index number for each individual ought to be established. And if need be, the register should be based on a finger-print identification. If a woman who is certified to have been convicted 12 times may really have 40 convictions against her, it is certainly worth some expense and trouble to have this knowledge with accuracy. Women who have been convicted 50 to 100 times are assuredly, from the standpoint of society, as needful of registration and identification as any habitual criminals. They are as great a power for ill in the land, and their careful study is as urgent and as valuable.

We are fully aware of the good work that has been done by several reformatory directors, but each of these men comes only in touch with a relatively limited material; their observations need extending, standardizing, and pooling, and this can only be done by a central authority. A standardized schedule of observations to be made and points to be recorded would not hinder the individual from following up special and personal lines of inquiry, but it would produce adequate material for safe statistical conclusions on many simple points. A most desirable addition to the staff of each reformatory would be a trained social worker, a volunteer, if it cannot be otherwise, but by preference a paid educated or even medically qualified woman,\* who would, like the similar assistants now attached to the medical officers of health, investigate the past environment and the family history of each case. It is only when the data gathered by such inquiries are available in mass that we shall be able to settle finally what are the causes of alcoholism, and how it can best be handled.

Looking at the Langho data dealt with in the course of this paper, we can only give, under reservation, the following suggestions:—

(i) If intensity of the alcoholic mania be measured by the number of convictions, there appears for constant age little relation between alcoholism and physical fitness.

(ii) There is a sensible relation between alcoholism and poor education and alcoholism and mental defect. We consider it probable, for reasons stated above, that the alcoholism is not due to the poor education, nor is it to any marked extent

\* The poorer districts of our large towns, where such assistants would largely have to work, are becoming more and more familiar, and resent less and less the inquiries of such *women* workers, even when they touch very intimate details of domestic economy. There are already medical officers of health, who ascertain from their women assistants whether in the case of each baby born a dummy teat is used, and where the supply of milk is kept, to say nothing of the cleanliness and orderliness of the parents and the ventilation of their homes. There is an immense field of work for women in the problems of social hygiene. It is becoming more and more often paid work and a specialized academic training, in part, but not wholly, medical must be developed to meet it.

productive of the mental defect, but the want of will-power and self-control, associated with mental defectiveness, is itself the antecedent of the poor education and of the alcoholism.

(iii) The physically stronger, judged from religion (or race) the emotionally more excitable, and, judged from intelligence the more mentally defective, tend more to alcoholism, and give, when sober in the reformatory, most trouble.

(iv) If alcoholism is the product of the association of emotionally excitable, physically strong natures with want of mental balance, we see that it is rather the hereditary than the environmental factor to which in alcoholism, as in criminality and insanity, the first attention must be paid. It is a study of stock, not of environment, which must give us the real clue to the treatment of alcoholism.

Whether we suppose the 63 % of mentally defective persons among these inebriates to be the source or the product of the alcoholism, one fact is clear, the reformatory does not restore them to mental efficiency, nor in the great bulk of cases give them the power to control to social advantage their own lives.

This is well illustrated by some details Dr. Gill gives as to his inmates. In 1908-9 38 women were released (*Report*, March, 1909). Of these 8 were doing well when last heard of, but even of these the post-reformatory history must only have been known for a very short period. 1 relapsed once, 1 was released as she was suffering from cancer, 1 ill when discharged was sent to a workhouse and subsequently relapsed, 2 were morally insane on reception, 2 were very feeble-minded but not certifiably insane, 1 became insane after discharge but 'kept out of trouble' while at liberty, 1 was epileptic and mentally peculiar, 1 suffered from chronic rheumatism and was practically unfit to earn her livelihood, 20 were feeble-minded in a less degree, but were obviously below the normal mental standard of working-class women. Of the 118 women released, 1906-8 (*Reports*, 1907, 1908, 1909), we are told that 45 relapsed, 1 was convicted for a crime other than drunkenness, 2 were insane, 24 could not be traced, and 46 were reported as doing well. In other words, in round numbers within an average of *two* years from their discharge, 41 % were again social wrecks,\* 20 % had disappeared,† i. e. probably migrated to another district where their relapse would not involve, owing to ignorance of their previous history, immediate recommittal, and 39 % were reported on a very brief experience as doing well.‡ Even if those 39 % were really reformed, the problem of the

\* Dr. Gill (*Report*, 1909, p. 16) says: "I have included as relapsed all those women who are reported to have been seen under the influence of drink, although they have not been convicted of any offence, and also one convicted of stealing, although drunkenness was not alleged."

† This 61 % of probable failures comes very near the 63 % of mental defectives.

‡ It is again a case of our need for further knowledge. Many will call to mind cases where an inebriate after treatment has done well for 3, 5, or even 10 years, and then the self-control has again failed. Some statistics due to Mr. R. J. Parr, Director of the Society for Prevention of Cruelty to Children, are cited by Dr. Branthwaite in his 1908 *Report*. Mr. Parr obtained particulars of 133 cases admitted to Reformatories between April 1, 1902, and March 31, 1904, whom he had watched for one



remainder is not solved by their brief detention in the reformatory. They have clearly not the mental power to control their course in life; they cannot become sober, hardworking women. They return to their former mode of life, and are sources of disease and social demoralization. If they become mothers, their children inherit their mental deficiency, and increase that section of the population which is reared at the expense of the State. In the reformatory the great bulk of these inebriates are well-behaved or manageable, and capable of doing a very fair amount of remunerative work. They are kept out of mischief and hindered from multiplying their kind. It appears to us that the problem of the inebriate woman, the problem of the lowest type of prostitute, and the problem of the habitual criminal are closely one with the treatment of the mentally defective. And we think there is considerable evidence to show that the mental defect of the female inebriate and of the male criminal is not the product of alcohol or of crime: it is the mental defect of the child still handicapping the adult. The segregation of the mentally defective child of both sexes is the first step in the effective treatment of both alcoholism and criminality; we have to meet want of mental control in its hereditary origin. We have tried reform, and we have tried punishment; we have tried teaching, and we have tried preaching; it remains to try segregation.

The importance of segregation and regulation from the age of puberty becomes manifest, if we consider the fertility of these inebriates. In his 1905 *Report*,\* Dr. Branthwaite gives an account of 352 women. Of the single women, 81.6 % were said to be childless, but the returns for these women must be very doubtful. Of the 193 married and widowed women, 23 % were childless. Prostitution probably accounts largely for the excess of childless women among both single and married. But the average number of children born to each married woman, excluding the childless, was 9.2, and to each widow, the childless excluded, 4.5! More moderate results are given for 846 married and widowed women (no longer, unfortunately, separated) for the years 1905-8, the average number of children born being 5.6, the childless women excluded, of whom there were 19.5 %. When it is remembered that 5 to 6 children is high for the *completed* families of the *better* artisan classes, and that the average age of these women is about 36 (see p. 21), so that their families are not completed, we see how great is the fertility of the married inebriates. The death-rate, however, is very great. While in Manchester the nett family of the sober is 4.3, and of the drinking mother 4.2, the death-rates being 26.5 % and 33.8 % respectively, with these extreme alcoholists the nett family is 3.1 and the death-rate 45.6 %. The death-rate, high as it is, does not, however, provide the social protection

*year or longer after discharge.* Of these 5 died or were sent to an asylum, of 15 he had no record, 54 relapsed, and 59 were reformed. This gives 44 % reformed for a period of *one year or longer*, but it is expressly stated that these were the inebriates with decent homes and few convictions. This compares closely with Dr. Gill's 39 %, also on a brief experience of after-history.

\* Table XV of *Report*.

which complete segregation of the mentally defective child would achieve. The 1,291 *single*, married, and widowed women, 63 % of whom were mentally defective, had 2,187 living children to whom they would largely hand on their anomalies.

Should the reader of this memoir have read a previous memoir\* on alcoholism issued by the Galton Laboratory, he may at first sight be puzzled by an apparent contradiction. In that case no close relation was found between mental defectiveness in the children and alcoholism in the parents. Here a close relationship is found between mental defect and alcoholism, and on the basis of it segregation of the mentally defectives advocated because of the hereditary character of such defect. We can only state results as they flow from our data, and then seek an explanation of any apparent discrepancy. In the Edinburgh and Manchester samples we found no excesses of mental defect in the children of the alcoholic; in the Langho data we find excess of mental defect in the alcoholists themselves, and anticipate it in their offspring. What is the probable explanation of this apparent discrepancy? We think there is little doubt of its true explanation. The mentally defective become *extreme* alcoholists, inebriates in constant conflict with the police because the mental defect is antecedent to their alcoholism. But because the bulk of the mentally defective become criminal or alcoholic, it does not follow that every alcoholist is mentally defective, and will breed mentally defective children. The extreme female cases of alcoholism which lead largely to the reformatory are to a great extent the product of mental defect, but these cases form something under  $\frac{1}{1000}$  of the female population, and have a large contingent of non-childbearing women. On the other hand, intemperate mothers form 15 % of our working-class population sample in Manchester and 36 % in Edinburgh. The 0.1 % of convicted inebriates does not affect returns based on these large percentages of those that drink without being convicted inebriates. In other words, there are other sources of a taste for alcohol beside mental defect; and as we have seen in the case of Edinburgh, the alcoholic parents, as a whole, follow the trades requiring greater intelligence and greater strength. It is one of the difficulties of much temperance reform that, finding mental defect associated with and probably the cause of the extreme cases of alcoholism, and in such cases undoubtedly followed by mental defect in the children, the supporters of the movement have asserted that parental alcoholism leads to mentally defective children, whereas the alcoholism is probably as much the product of the mental defect in these extreme cases as the mentally defective children are. We do not propose the segregation of all extreme cases of alcoholism, but the segregation of the mentally defectives, as they form one, if not the principal, source of such extreme cases. Further, we think it unreasonable that facts relating to perhaps 0.1 % of convicted inebriates should be stated as applying to the whole alcohol-using section of the community.

\* *A First Study of the Influence of Parental Alcoholism on the Physique and Ability of the Offspring.* Second Edition, 1910, Dulau & Co.



As to the remedy for extreme cases which we propose, only those who make a fetish of personal liberty—in this case largely the liberty to annoy, if not to demoralize, their neighbours—can take objection to Dr. Gill's conclusion in his last *Report*: "That public decency and morality, economy, humanity, and many other reasons call for the segregation of inebriates" (*Report*, 1909).

But this segregation on any large scale is, we hold, only a temporary necessity. With the segregation of mentally defective children the number of certified inebriates to be segregated would grow less and less year by year, and those left having more normal intelligence would be those who were more susceptible of the permanent reform, which it was originally hoped would flow in the bulk of cases from a temporary seclusion.

# APPENDIX OF TABLED DATA

TABLE A. AGE AND NUMBER OF CONVICTIONS.

No. of Convictions.	Age.																		Totals.
	16- 18.	19- 21.	22- 24.	25- 27.	28- 30.	31- 33.	34- 36.	37- 39.	40- 42.	43- 45.	46- 48.	49- 51.	52- 54.	55- 57.	58- 60.	61- 63.	64- 66.	67- 69.	
1-5	—	2	—	5	2	5	2	3	3	1	2	2	2	—	—	—	—	—	29
6-10	—	7	5	9	7	8	8	4	3	6	2	3	2	—	1	—	—	—	65
11-15	1	2	4	6	6	—	7	9	1	5	2	1	1	—	1	—	—	—	46
16-20	—	—	4	5	9	6	4	1	4	1	2	1	2	—	—	—	—	—	39
21-25	—	1	2	3	6	2	2	4	3	—	—	1	2	1	—	—	—	—	27
26-30	—	—	—	4	2	2	3	3	3	1	2	2	—	—	—	—	—	1	23
31-35	—	—	—	5	3	2	1	2	1	1	—	—	—	—	1	—	—	—	16
36-40	—	—	—	1	1	—	1	1	1	1	—	—	—	1	—	—	—	—	7
41-45	—	—	—	—	1	4	2	3	4	1	—	—	1	—	—	1	—	—	17
46-50	—	1	—	—	—	—	1	1	1	—	1	1	1	—	—	—	—	—	7
51-55	—	—	—	2	—	2	3	—	1	1	3	—	—	—	—	—	—	—	12
56-60	—	—	—	—	—	—	1	—	2	1	—	—	—	—	—	—	—	—	4
61-65	—	—	—	—	1	2	1	—	1	—	—	2	—	—	—	—	—	—	7
66-70	—	—	—	—	—	—	3	—	1	2	—	—	—	—	—	—	—	—	6
71-75	—	—	—	1	1	1	—	—	1	—	—	—	—	—	—	—	—	—	4
76-80	—	—	—	—	—	—	1	—	1	—	—	—	—	—	—	—	—	—	2
81-85	—	—	—	—	—	—	—	1	—	—	—	—	—	1	—	—	—	—	2
86-90	—	—	—	—	—	—	—	—	1	—	—	—	1	—	—	—	—	—	2
91-95	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
96-100	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
101-105	—	—	—	—	—	—	1	—	—	—	—	—	—	—	—	—	—	—	1
106-110	—	—	—	—	—	—	—	—	1	—	—	1	—	—	—	—	—	—	2
111-115	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
116-120	—	—	—	—	—	1	—	—	—	—	—	—	—	—	—	—	—	—	1
121-125	—	—	—	—	—	—	1	—	—	—	—	—	—	—	—	—	—	—	1
126-130	—	—	—	—	—	—	—	—	—	1	—	—	—	1	—	—	—	—	2
131-135	—	—	—	—	—	—	—	—	1	—	—	—	—	—	—	—	—	—	1
136-140	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
141-145	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
146-150	—	—	—	—	—	—	1	—	—	—	2	—	—	—	—	—	—	—	3
151-155	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
156-160	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1	—	—	1
161-165	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1	—	1
Totals .	1	13	15	41	39	35	43	32	34	22	16	14	12	4	3	2	—	2	328



# EXTREME ALCOHOLISM IN ADULTS

47

TABLE B. FORMAL EDUCATION AND NUMBER OF CONVICTIONS.

TABLE C. RELIGION AND NUMBER OF CONVICTIONS.

No. of Convictions.	Formal Education.								Totals.	Religion.	
	Good.	Fair.	Elementary.	Imperfect.	Poor.	Defective.	Bad.	Nil.		Roman Catholic.	Protestant.
1-5	5	2	19	1	1	—	—	1	29	12	17
6-10	3	1	56	2	—	1	—	2	65	24	41
11-15	—	1	37	4	—	2	—	2	46	21	25
16-20	5	1	28	1	1	2	—	1	39	17	22
21-25	1	—	20	1	—	1	1	3	27	17	10
26-30	1	1	18	2	—	—	—	1	23	11	12
31-35	—	1	9	3	—	1	1	1	16	9	7
36-40	—	1	4	—	—	1	—	1	7	5	2
41-45	1	—	13	—	—	—	—	3	17	12	5
46-50	—	—	5	1	—	—	—	1	7	5	2
51-55	—	—	11	—	—	—	—	1	12	6	6
56-60	—	—	3	—	—	—	—	1	4	3	1
61-65	—	—	6	—	—	—	—	1	7	5	2
66-70	—	—	3	1	—	1	—	1	6	2	4
71-75	—	1	2	—	—	1	—	—	4	3	1
76-80	—	—	1	—	—	—	—	1	2	1	1
81-85	—	—	—	1	—	—	—	1	2	2	—
86-90	—	—	2	—	—	—	—	—	2	1	1
91-95	—	—	—	—	—	—	—	—	—	—	—
96-100	—	—	—	—	—	—	—	—	—	—	—
101-105	—	—	1	—	—	—	—	—	1	1	—
106-110	—	—	2	—	—	—	—	—	2	2	—
111-115	—	—	—	—	—	—	—	—	—	—	—
116-120	—	—	—	1	—	—	—	—	1	1	—
121-125	—	—	1	—	—	—	—	—	1	1	—
126-130	—	—	1	—	—	—	—	1	2	1	1
131-135	—	—	1	—	—	—	—	—	1	1	—
136-140	—	—	—	—	—	—	—	—	—	—	—
141-145	—	—	—	—	—	—	—	—	—	—	—
146-150	—	—	1	—	—	—	2	—	3	2	1
151-155	—	—	—	—	—	—	—	—	—	—	—
156-160	—	—	1	—	—	—	—	—	1	—	1
161-165	—	—	—	—	—	—	—	1	1	1	—
Totals .	16	9	245	18	2	10	4	24	328	166	162

TABLE D. FORMAL EDUCATION AND AGE.

Formal Education.	Age.																		Totals.
	16-18.	19-21.	22-24.	25-27.	28-30.	31-33.	34-36.	37-39.	40-42.	43-45.	46-48.	49-51.	52-54.	55-57.	58-60.	61-63.	64-66.	67-69.	
Good . . .	—	—	—	1	3	1	3	3	2	1	1	—	1	—	—	—	—	—	16
Fair . . .	—	2	—	2	—	—	—	1	2	1	—	—	1	—	—	—	—	—	9
Elementary .	1	10	13	33	32	28	37	22	23	12	13	10	6	1	1	2	—	1	245
Imperfect .	—	—	—	2	1	2	1	2	2	4	—	2	1	—	1	—	—	—	18
Poor . . .	—	1	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	2
Defective .	—	—	—	1	1	2	2	1	—	1	—	—	1	1	—	—	—	—	10
Bad . . .	—	—	—	1	—	—	—	—	1	—	2	—	—	—	—	—	—	—	4
Nil . . .	—	—	1	1	2	2	—	3	4	3	—	2	2	2	1	—	—	1	24
Totals . .	1	13	15	41	39	35	43	32	34	22	16	14	12	4	3	2	—	2	328

TABLE B'. EFFECTIVE EDUCATION AND  
NUMBER OF CONVICTIONS.

No. of Convictions.	Effective Education.				Totals.
	Superior Education.	Can read and write well.	Can read and write imperfectly.	Can neither read nor write.	
1-5	2	5	5	2	14
6-10	5	8	12	9	34
11-15	—	9	10	7	26
16-20	1	11	22	1	35
21-25	—	2	11	5	18
26-30	1	6	8	2	17
31-35	—	2	10	2	14
36-40	—	1	2	—	3
41-45	—	2	6	2	10
46-50	—	—	3	1	4
51-55	—	—	6	2	8
56-60	—	—	2	1	3
61-65	—	—	2	2	5
66-70	—	—	2	1	3
71-75	—	—	2	—	2
76-80	—	—	1	—	1
81-85	—	—	—	1	1
86-90	—	—	1	1	2
91-95	—	—	—	—	—
96-100	—	—	—	—	—
101-105	—	—	1	—	1
106-110	—	—	1	—	1
111-115	—	—	—	—	—
116-120	—	—	—	1	1
121-125	—	—	—	—	—
126-130	—	—	1	—	1
131-135	—	—	1	—	1
136-140	—	—	—	—	—
141-145	—	—	—	—	—
146-150	—	—	—	1	1
151-155	—	—	—	—	—
156-160	—	—	—	1	1
Totals .	9	46	110	42	207

TABLE D'. EFFECTIVE EDUCATION  
AND AGE.

Age.	Effective Education.				Totals.
	Superior Education.	Can read and write well.	Can read and write imperfectly.	Can neither read nor write.	
16-18	—	—	1	—	1
19-21	—	2	4	2	8
22-24	—	2	7	2	11
25-27	—	3	12	6	26
28-30	1	7	18	—	26
31-33	1	8	10	3	22
34-36	3	5	18	5	31
37-39	1	6	9	5	21
40-42	2	1	12	6	21
43-45	1	2	7	—	10
46-48	—	1	6	2	9
49-51	—	2	2	3	7
52-54	—	1	3	4	8
55-57	—	—	—	1	1
58-60	—	—	—	2	2
61-63	—	—	1	1	2
64-66	—	—	—	—	—
67-69	—	1	—	—	1
Totals .	9	46	110	42	207



TABLE E. RELIGION AND AGE.

Religion.	Age.																		Totals.
	16-18.	19-21.	22-24.	25-27.	28-30.	31-33.	34-36.	37-39.	40-42.	43-45.	46-48.	49-51.	52-54.	55-57.	58-60.	61-63.	64-66.	67-69.	
Roman Catholic	1	6	10	23	19	20	18	19	18	10	5	5	4	4	2	1	—	1	166
Protestant . .	—	7	5	18	20	15	25	13	16	12	11	9	8	—	1	1	—	1	162
Totals . .	1	13	15	41	39	35	43	32	34	22	16	14	12	4	3	2	—	2	328

TABLE F. RELIGION AND FORMAL EDUCATION.

Religion.	Formal Education.								Totals.
	Good.	Fair.	Elementary.	Imperfect.	Poor.	Defective.	Bad.	Nil.	
Roman Catholic . .	6	5	118	9	1	5	4	18	166
Protestant . . . .	10	4	127	9	1	5	—	6	162
Totals . . . .	16	9	245	18	2	10	4	24	328

TABLE G. FORMAL EDUCATION AND MENTAL CAPACITY.

Mental Capacity.	Formal Education.								Totals.
	Good.	Fair.	Elementary.	Imperfect.	Poor.	Defective.	Bad.	Nil.	
Normal . . . . .	10	3	70	4	—	—	2	3	92
Slightly Defective .	1	—	15	1	2	—	—	1	20
Defective . . . . .	1	1	59	2	1	6	1	7	78
Very Defective . .	—	—	10	4	—	2	—	—	16
Insane . . . . .	—	—	1	—	—	—	—	—	1
Totals . . . . .	12	4	155	11	3	8	3	11	207

## FOURFOLD TABLES.

F<sup>bis</sup>. RELIGION AND FORMAL EDUCATION.

Religion.	Formal Education.		Totals.
	Better.	Worse.	
Roman Catholic .	129	37	166
Protestant . . .	141	21	162
Totals . .	270	58	328

G<sup>bis</sup>. MENTAL CAPACITY AND FORMAL EDUCATION.

Mental Capacity.	Formal Education.		Totals.
	Better.	Worse.	
Normal . . . . .	83	9	92
Defective . . . .	88	27	115
Totals . .	171	36	207

TABLES F' AND G'. EFFECTIVE EDUCATION, RELIGION, AND MENTAL CONDITION.

Effective Education.	Religion.		Mental Condition.					Totals.
	Roman Catholic.	Protestant.	Normal.	Slightly Defective.	Defective.	Very Defective.	Insane.	
Superior Education . . . .	7	2	8	—	1	—	—	9
Can read and write well . .	13	33	35	4	6	—	1	46
Can read and write imperfectly .	52	58	36	11	55	8	—	110
Can neither read nor write .	27	15	13	5	16	8	—	42
Totals . . . . .	99	108	92	20	78	16	1	207

## FOURFOLD TABLES.

F' bis. RELIGION AND EFFECTIVE EDUCATION.

Effective Education.	Religion.		Totals.
	Roman Catholic.	Protestant.	
Better . .	20	35	55
Worse . .	79	73	152
Totals .	99	108	207

G' bis. MENTAL CONDITION AND EFFECTIVE EDUCATION.

Effective Education.	Mental Condition.		Totals.
	Average.	Defective.	
Better . .	43	12	55
Worse . .	49	103	152
Totals .	92	115	207

TABLES H AND I. AGE, OCCUPATION, AND CIVIL STATUS.

Civil Status.	Occupation.	Age.																		Totals.
		16-18.	19-21.	22-24.	25-27.	28-30.	31-33.	34-36.	37-39.	40-42.	43-45.	46-48.	49-51.	52-54.	55-57.	58-60.	61-63.	64-66.	67-69.	
Single	Employed .	1	8	7	15	10	8	12	6	9	2	2	1	—	—	1	—	—	—	82
	Housewives	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	Prostitutes .	—	5	7	11	11	5	10	4	5	2	—	1	—	—	—	1	—	—	62
Married	Independent	—	—	—	—	—	1	—	—	—	—	—	—	—	—	—	—	—	—	1
	Employed .	—	—	—	7	12	11	11	11	8	5	3	8	5	2	—	—	—	1	84
	Housewives	—	—	—	5	2	2	3	6	7	4	4	1	3	1	1	—	—	—	39
Widowed	Prostitutes .	—	—	1	3	4	4	4	1	4	2	1	1	—	—	—	—	—	—	25
	Independent	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	Employed .	—	—	—	—	—	2	3	2	—	5	5	2	3	1	1	—	—	1	25
Totals . . . .	Housewives	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	Prostitutes .	—	—	—	—	—	2	—	2	1	2	1	—	1	—	—	1	—	—	10
	Independent	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Totals . . . .		1	13	15	41	39	35	43	32	34	22	16	14	12	4	3	2	—	2	328

TABLES J AND K. INTENSITY OF ALCOHOLISM, OCCUPATION, AND CIVIL STATUS.

Civil Status.	Occupation.	Number of Convictions.																								Totals.										
		1-5.	6-10.	11-15.	16-20.	21-25.	26-30.	31-35.	36-40.	41-45.	46-50.	51-55.	56-60.	61-65.	66-70.	71-75.	76-80.	81-85.	86-90.	91-95.	96-100.	101-105.	106-110.	111-115.	116-120.		121-125.	126-130.	131-135.	136-140.	141-145.	146-150.	151-155.	156-160.	161-165.	
Single	Employed .	7	23	7	8	5	4	4	1	3	3	7	—	1	2	2	—	1	1	—	1	—	—	—	—	1	—	—	—	—	—	—	—	—	—	—
	Housewives	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
	Prostitutes .	2	8	9	7	6	4	5	3	3	1	2	1	3	1	1	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
Married	Employed .	9	16	14	12	8	5	3	3	4	—	1	1	3	1	1	1	—	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
	Housewives	7	8	8	2	4	4	1	—	2	1	—	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
	Prostitutes .	—	4	6	6	1	4	1	3	1	2	—	1	—	—	1	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
Widowed	Employed .	2	4	2	2	3	1	1	—	2	2	1	—	—	2	—	—	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
	Housewives	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
	Prostitutes .	2	1	—	2	—	1	1	—	2	—	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
Totals . . . .		29	65	46	39	27	23	16	7	17	7	12	4	7	6	4	2	2	2	—	1	2	—	—	—	1	1	1	2	1	—	3	—	1	1	328



TABLE L. INTENSITY OF ALCOHOLISM AND MENTAL CONDITION.

TABLE M. INTENSITY OF ALCOHOLISM AND PHYSICAL CONDITION.

TABLE N. INTENSITY OF ALCOHOLISM AND CONDUCT IN REFORMATORY.

No. of Convictions.	L. Mental Condition.					M. Physical Condition.		N. Conduct in Reformatory.				Totals.
	Normal.	Slightly defective.	Defective.	Very Defective.	Insane.	Fit for Hard Work.	Unfit for Hard Work.	Well-behaved.	Manageable.	Troublesome.	Very Troublesome.	
1-5	6	1	6	1	—	11	3	11	3	—	—	14
6-10	17	3	11	3	—	26	8	25	7	—	2	34
11-15	16	3	6	1	—	25	1	21	3	2	—	26
16-20	15	5	14	1	—	27	8	23	8	2	2	35
21-25	6	2	8	2	—	13	5	13	2	2	1	18
26-30	8	3	5	—	1	13	4	13	3	1	—	17
31-35	8	—	3	3	—	11	3	7	5	—	2	14
36-40	3	—	—	—	—	3	—	2	1	—	—	3
41-45	6	—	4	—	—	9	1	9	1	—	—	10
46-50	1	—	3	—	—	2	2	4	—	—	—	4
51-55	4	2	2	—	—	6	2	7	—	—	1	8
56-60	—	—	3	—	—	2	1	3	—	—	—	3
61-65	—	1	4	—	—	2	3	4	1	—	—	5
66-70	1	—	2	—	—	3	—	1	1	1	—	3
71-75	1	—	1	—	—	2	—	—	2	—	—	2
76-80	—	—	—	1	—	1	—	—	—	—	1	1
81-85	—	—	—	1	—	1	—	—	—	—	1	1
86-90	—	—	1	1	—	1	1	1	—	—	1	2
91-95	—	—	—	—	—	—	—	—	—	—	—	—
96-100	—	—	—	—	—	—	—	—	—	—	—	—
101-105	—	—	1	—	—	1	—	1	—	—	—	1
106-110	—	—	—	1	—	—	1	1	—	—	—	1
111-115	—	—	—	—	—	—	—	—	—	—	—	—
116-120	—	—	1	—	—	1	—	—	1	—	—	1
121-125	—	—	—	—	—	—	—	—	—	—	—	—
126-130	—	—	—	1	—	1	—	—	1	—	—	1
131-135	—	—	1	—	—	1	—	—	1	—	—	1
136-140	—	—	—	—	—	—	—	—	—	—	—	—
141-145	—	—	—	—	—	—	—	—	—	—	—	—
146-150	—	—	1	—	—	—	1	1	—	—	—	1
151-155	—	—	—	—	—	—	—	—	—	—	—	—
156-160	—	—	1	—	—	—	1	—	1	—	—	1
161-165	—	—	—	—	—	—	—	—	—	—	—	—
Totals .	92	20	78	16	1	162	45	147	41	8	11	207

TABLE O. MENTAL CONDITION AND PHYSICAL CONDITION.

Physical Condition.	Mental Condition.					Totals.
	Normal.	Slightly Defective.	Defective.	Very Defective.	Insane.	
Fit for Hard Work . .	85	14	53	10	—	162
Unfit for Hard Work . .	7	6	25	6	1	45
Totals . . . . .	92	20	78	16	1	207

# EXTREME ALCOHOLISM IN ADULTS

53

TABLE P. CONDUCT IN REFORMATORY AND MENTAL CONDITION.

TABLE Q. CONDUCT IN REFORMATORY AND PHYSICAL CONDITION.

Conduct.	P. Mental Condition.					Totals.	Q. Physical Condition.	
	Normal.	Slightly Defective.	Defective.	Very Defective.	Insane.		Fit for Hard Work.	Unfit for Hard Work.
Well-behaved . .	79	18	40	9	1	147	110	37
Manageable . . .	12	2	25	2	—	41	37	4
Troublesome . .	1	—	7	—	—	8	7	1
Very Troublesome	—	—	6	5	—	11	8	3
Totals . . .	92	20	78	16	1	207	162	45

## FOURFOLD TABLES.

O bis. MENTAL AND PHYSICAL CONDITIONS.

P bis. CONDUCT AND MENTAL CONDITION.

Q bis. CONDUCT AND PHYSICAL CONDITION.

Physical Condition.	Mental Condition.		Totals.
	Normal.	Defective.	
Fit . .	85	77	162
Unfit . .	7	38	45
Totals .	92	115	207

Conduct.	Mental Condition.		Physical Condition.		Totals.
	Normal.	Defective.	Fit.	Unfit.	
Well-behaved . .	79	68	110	37	147
Not Well-behaved	13	47	52	8	60
Totals . . .	92	115	162	45	207

TABLE R. AGE AND MENTAL CONDITION.

TABLE S. AGE AND PHYSICAL CONDITION.

TABLE T. AGE AND CONDUCT IN REFORMATORY.

Age.	R. Mental Condition.					S. Physical Condition.		T. Conduct in Reformatory.				Totals.
	Normal.	Slightly Defective.	Defective.	Very Defective.	Insane.	Fit for Hard Work.	Unfit for Hard Work.	Well-behaved.	Manageable.	Troublesome.	Very Troublesome.	
16-18	—	1	—	—	—	1	—	1	—	—	—	1
19-21	5	1	2	—	—	7	1	5	3	—	—	8
22-24	4	1	6	—	—	9	2	7	2	1	1	11
25-27	14	2	7	3	—	24	2	15	7	2	2	26
28-30	13	1	10	2	—	22	4	16	7	—	3	26
31-33	9	2	10	—	1	17	5	16	4	1	1	22
34-36	12	6	12	1	—	25	6	20	7	3	1	31
37-39	11	2	6	2	—	21	—	17	2	1	1	21
40-42	8	2	11	—	—	14	7	14	6	—	1	21
43-45	5	—	3	2	—	7	3	8	1	—	1	10
46-48	2	—	6	1	—	5	4	8	1	—	—	9
49-51	2	2	2	1	—	5	2	7	—	—	—	7
52-54	4	—	2	2	—	4	4	8	—	—	—	8
55-57	—	—	—	1	—	—	1	1	—	—	—	1
58-60	1	—	—	1	—	—	2	2	—	—	—	2
61-63	1	—	1	—	—	1	1	1	1	—	—	2
64-66	—	—	—	—	—	—	—	—	—	—	—	—
67-69	1	—	—	—	—	—	1	1	—	—	—	1
Totals .	92	20	78	16	1	162	45	147	41	8	11	207

TABLES U, V, W, AND X. EFFECTIVE EDUCATION AND PHYSICAL CONDITION, CONDUCT, PROSTITUTION AND FORMAL EDUCATION.

Effective Education.	U			V			W			X							Totals.	
	Physical Condition.		Well-behaved.	Conduct.		Very Troublesome.	Prostitution.		Formal Education.									
	Fit.	Unfit.		Manageable.	Troublesome.		Prostitutes.	Non-Prostitutes.	Good.	Fair.	Elementary.	Imperfect.	Poor.	Defective.	Bad.	Nil.		
Superior Education . . . .	8	1	8	1	—	—	3	6	6	—	3	—	—	—	—	—	—	9
Can read and write well . .	43	3	39	5	2	—	21	25	5	2	35	2	1	1	—	—	—	46
Can read and write imperfectly	82	28	66	30	5	9	51	59	1	1	90	7	1	5	—	—	—	110
Can neither read nor write .	29	13	34	5	1	2	8	34	—	1	27	3	—	2	3	6	—	42
Totals . . . . .	162	45	147	41	8	11	83	124	12	4	155	12	2	8	3	11	—	207

FOURFOLD TABLES. U bis, V bis, W bis, X bis.

EFFECTIVE EDUCATION AND PHYSICAL CONDITION, CONDUCT, PROSTITUTION, AND FORMAL EDUCATION.

Effective Education.	U bis		V bis		W bis		X bis		Totals.
	Physical Condition.		Conduct.		Prostitution.		Formal Education.		
	Fit.	Unfit.	Well-behaved.	Trouble-some.	Prostitutes.	Non-Prostitutes.	Better.	Worse.	
Better Education .	51	4	47	8	24	31	51	4	55
Worse Education .	111	41	100	52	59	93	120	32	152
Totals . . . .	162	45	147	60	83	124	171	36	207



TABLES Y, Z, AND ZZ. CIVIL STATUS AND OCCUPATION AND MENTAL CONDITION, PHYSICAL CONDITION, AND CONDUCT.

Civil Status.	Occupation.	Mental Condition.					Physical Condition.		Conduct.				Totals.
		Normal.	Slightly Defective.	Defective.	Very Defective.	Insane.	Fit for Work.	Unfit for Work.	Well-behaved.	Manageable.	Trouble-some.	Very Trouble-some.	
Single	Employed . .	17	8	14	6	—	37	8	29	10	3	3	45
	Housewives .	—	—	—	—	—	—	—	—	—	—	—	—
	Prostitutes .	23	—	24	5	—	43	9	27	16	2	7	52
	Independent .	1	—	—	—	—	1	—	1	—	—	—	1
Married	Employed . .	21	6	11	3	—	32	9	34	5	1	1	41
	Housewives .	12	3	9	—	—	19	5	19	5	—	—	24
	Prostitutes .	6	1	13	1	1	15	7	17	3	2	—	22
	Independent .	—	—	—	—	—	—	—	—	—	—	—	—
Widowed	Employed . .	5	2	5	1	—	7	6	12	1	—	—	13
	Housewives .	—	—	—	—	—	—	—	—	—	—	—	—
	Prostitutes .	7	—	2	—	—	8	1	8	1	—	—	9
	Independent .	—	—	—	—	—	—	—	—	—	—	—	—
Totals . . . .		92	20	78	16	1	162	45	147	41	8	11	207

OXFORD: HORACE HART  
PRINTER TO THE UNIVERSITY











